



# WESTERN INDUSTRY

VOLUME IX

NO. 2

Twenty-Five Cents

February 1944



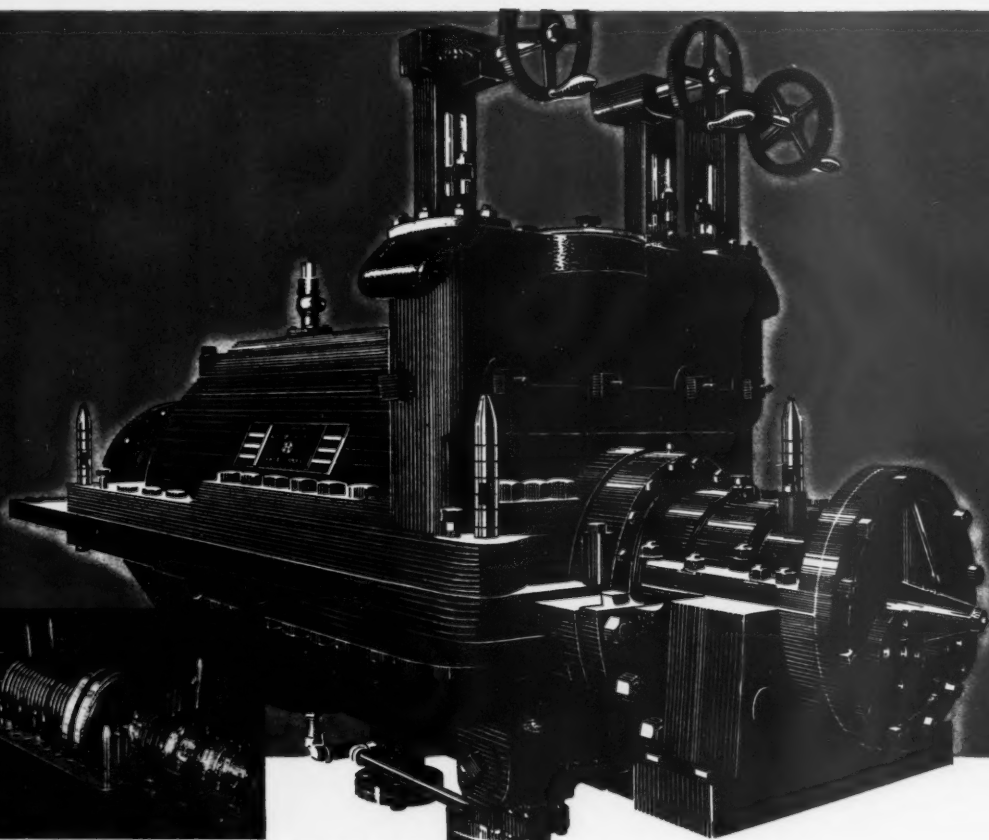
# VICTOR



**R**eally...you cannot purchase a better welding torch than a VICTOR. And, for the fine welding required for aluminum and magnesium, the VICTOR "Spiral Mixer" produces and maintains every flame adjustment your operator will need. Photographs, by courtesy of Dow Chemical Company, show proper flame adjustment and welding procedure for magnesium.

## **VICTOR EQUIPMENT COMPANY**

844 Folsom Street  
San Francisco 7



# WHIRLWINDS OF POWER

The driving force for hundreds of America's merchant ships today are mighty whirlwinds of steam power locked in steel cases—technically known as turbines. The trick in making such units lies in the manufacturer's ability to build meticulously into them perfect operation, smoothness, quiet and absolute balance—for the internal mechanism whirls at 6000 revolutions per minute!

Told that "they couldn't be built" on a large-scale production-line basis, Hendy, nevertheless,

did it, and thus wrote a new chapter in the history of turbine building, telescoping a decade of progress into just twenty months.

For the Maritime Commission, Hendy now builds main propulsion equipment, turbo-generator sets, and marine turbines up to 8500 hp complete with reduction gear sets. Other Hendy products include Crocker-Wheeler motors and generators, and Pomona and Westco pumps for industry and agriculture.

**JOSHUA HENDY DIVISION**

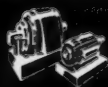
**JOSHUA HENDY IRON WORKS**

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*Hendy  
Products*



MOTORS & GENERATORS  
CROCKER-WHEELER  
DIVISION



TURBINE UNITS  
POMONA PUMP  
DIVISION

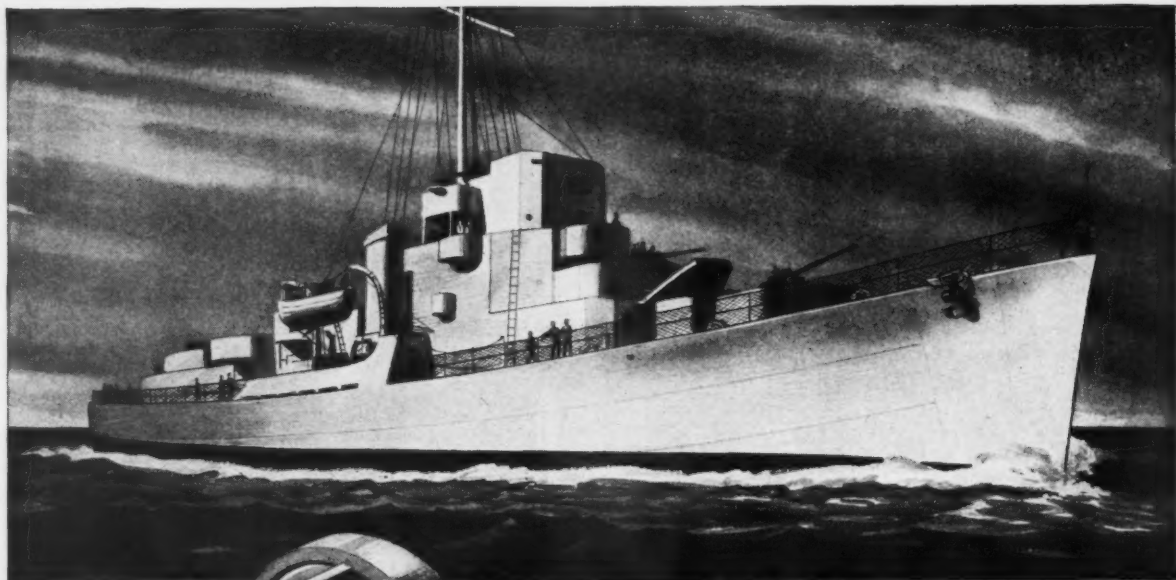


PUMP UNITS  
WESTCO PUMP  
DIVISION



STEAM TURBINES, DIESELS  
JOSHUA HENDY  
DIVISION





In Frigate Escort Vessels . . .

# BEARINGS

*take a beating*

## Gardiner fabricated bearings can take it!

Fabricated bearings mean added strength to resist the merciless pounding . . . the terrific vibration and strain that comes from churning through the water at top speed after Nazi subs.

Fabrication means other advantages, too. Closer tolerance . . . ease of installation . . . less machine work . . . speedy production . . . economy and lightness. Maybe we shouldn't say *light*, because 1000 pounds is heavy in any man's language. But set a Gardiner fabricated stern tube or "A" frame bearing beside an ordinary bearing . . . and you'll see what we mean.

*Send your inquiries NOW for...*

### GARCO FABRICATED

Bearings • Shells • Turnbuckles • Tanks • Masts and Booms • Pantograph Flame Cut Plates  
Ship Sections • Fabricated Assemblies

### GARCO FORGED

Bolts & Nuts • Chain Plates • Boom Parts  
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## GARDINER MFG. COMPANY

*Drop . . . Upset . . . Hammer Forgings*

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SYMBOLIC EMBLEM OF THE  
DROP FORGING ASSOCIATION



## EDITORIAL COMMENT

(Communications on any subject of interest to our readers are welcomed. If author wishes, his name will not be used. Unsigned contributions will be disregarded.)

### Jeepers Creepers

WE PUBLISHED the accompanying cartoon too soon. At the time it first appeared in *Western Industry*, in the December, 1943, issue, we felt it was almost a libel on the West as a whole, in view of the alert and intelligent post-war planning being done by so many firms and groups. But the sudden general awakening to the fact that we are heavily oversupplied with steel, aluminum, and copper, machine tools and many forms of finished equipment and supplies, with the resulting imminence of partial shut-downs in many big war production establishments, justifies using the cartoon again, because industry in the West, as a group, has done absolutely nothing to prepare itself against the future consequences of the situation.



"JEEPERS CREEPERS"

—San Francisco Call-Bulletin

From now on the big problem will be the future of our big Western war plants, and although an intelligent program on disposal of plants, equipment and supplies is being worked out in Congress for the nation as a whole, there is no guarantee that the needs of the Western industrial community will be sufficiently taken into consideration by those who administer the disposal plans. What may appear to Eastern eyes to be adequate provision for the West may actually throttle Western development for the time being.

Right here is where industry in the West has gone to sleep, like the nodding old gentlemen in the cartoon. Some Western industrial leaders are awake, to be sure, but industry as a whole has either assumed the wartime honeymoon would last a whole lot longer or else figured that nothing could be done about it. There is too much at stake, however, to permit Washington to do as it pleases about shut-downs, without the West being heard. Political groups are already active in the matter, and much of their effort is to be highly commended, but these problems must be met on an economic basis. It is not good economics to let huge war plants become virtually WPA projects by continuing to operate when there is no need for it, but on the other hand the West cannot afford to have these plants go out of use entirely if they can be adapted to future needs of the West. Consequently there is need for the Western industrial community to express itself; otherwise the retrenchment may be either too great or too little.

The voice of industry must be heard. Not the voice of individual profit, but industry as a whole,—the industry that makes jobs and careers, buys material and equipment and builds up communities. Industry in the West must get itself together and do some united talking.

# WESTERN INDUSTRY

News, Methods, Solutions to Problems of the Principal Manufacturing and Processing Industries of the West

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### OUR COVER PICTURE

• Steel, backbone of heavy industry, is now a leading product in the industrial empire of the West, with two big steel mills able to supply the West's needs. The cover picture shows an open hearth scene in the mill of Kaiser Company, Iron and Steel Division, at Fontana, California. Like many other southern California developments, the visions of visionaries were found to be the logic of economics, and a mill to supply one of the most important industrial areas of the country was built in a valley previously devoted to orange growing.



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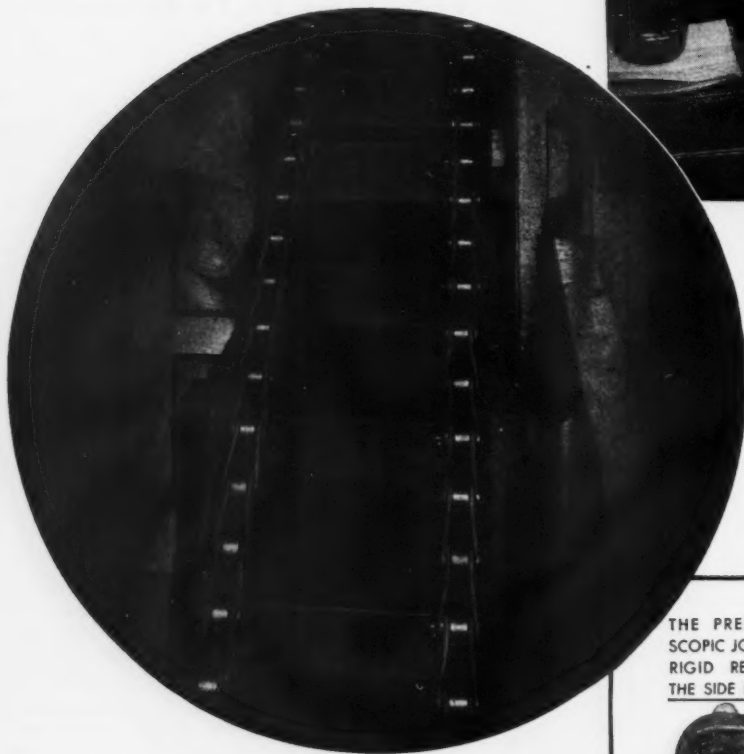
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Chicago Office: A. C. PETERSEN, District Manager, 5833 S. Spaulding Avenue, Chicago 29, Telephone: PRospect 1685.

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# THIS CONVEYOR MAKES HASTE WITH WASTE

**① GETTING OUT THE SCRAP** was a big headache in this plant. Their scrap conveyor was a jinx, if I ever saw one. No matter how much attention they gave it . . . with the best of maintenance care . . . it always managed to break down just at the wrong time and tie up the works.



**② IT'S A DIFFERENT STORY NOW.** The whole trouble centered on the chain belt. The chain they were using wasn't tough enough to stand up under the kind of service this conveyor demanded. The solution was easy. It was a made-to-order job for Rex Cast Roller chain belt. Since they made the changeover, they haven't had a bit of trouble.

**③ HERE'S WHAT MAKES REX CAST ROLLER CHAIN TOUGH.** This cutaway view shows its distinctive telescopic barrel construction. Note the way one barrel fits into the other to form a rigid link. Chain rollers roll easily and will not bind. Long life and trouble-free service are assured.

★ ★ ★

*The Rex Man can help you with your chain belt and conveyor application problems; and for engineering data on Rex Cast Roller chains, ask for your copy of the 768 page Catalog No. 444. Chain Belt Company, 1723 West Bruce Street, Milwaukee 4, Wisconsin.*

THE PRESS FITTED TELESCOPIC JOINT ESTABLISHES A RIGID RELATION BETWEEN THE SIDE BARS.

ROLLERS ARE ALWAYS FREE TO TURN. SIDE BAR SPACING IS MAINTAINED BY THE TELESCOPIC CONSTRUCTION.



T-HEAD PINS ARE LOCKED SECURELY AGAINST TURNING IN THE SIDE BARS.

SIDE BARS OF MALLEABLE IRON OR Z-METAL ARE PROPORTIONED FOR STRENGTH AND DURABILITY.



## CHAIN BELTS

*In more than 2000 sizes and types for the positive transmission of power, timing of operations and conveying of materials.*

# CHAIN BELT COMPANY OF MILWAUKEE

Rex Chain Belt and Transmission Division, Rex Conveying and Engineering Products Division, Milwaukee 4, Wis. - Baldwin-Duckworth Chain Belt Division, Springfield 2, Mass., Worcester 3, Mass.

# SAFEGUARDING THE HELICOPTER'S HEART

One feature that has played an important part in the success of the Sikorsky helicopter is the development of "cyclic pitch control."

The mechanism that operates this control passes through the main rotor hub.

It is the heart of the helicopter.

And you will find this heart fastened safely and securely with Elastic Stop Nuts.

These are the nuts with the red elastic collar—the nuts which have revolutionized aircraft construction.

That red collar hugs the bolt and grips tight. It does not loosen under vibration or shock. It locks fast—anywhere on the bolt.

Nevertheless, you can take Elastic Stop Nuts off, and put them back on, time and time again, and they still retain their locking effectiveness.

Elastic Stop Nuts are going to prove godsend in countless postwar fastening problems. They will make products safer, better and longer lasting.

Any time you wish, our engineers will be glad to help with whatever fastening job you might have. They will recommend the correct Elastic Stop Nut to meet the situation.

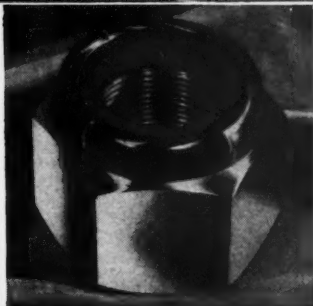
Elastic Stop Nuts are an old story on Sikorsky aircraft. They have been used on the Sikorsky clipper ships for years. They are found throughout the helicopter holding important structural fastenings.

LOCKED ON THE BOLT BY THE ACTION OF THE GRIPPING RED COLLAR.



THE COLLAR IS ELASTIC, THE NUT CAN BE USED TIME AND TIME AGAIN.

MADE IN ALL SIZES AND TYPES—WITH THREADS TO FIT ANY STANDARD TYPES OF BOLTS.



## ESNA

TRADE MARK OF

ELASTIC STOP NUT CORPORATION OF AMERICA  
UNION, NEW JERSEY AND LINCOLN, NEBRASKA



### ELASTIC STOP NUTS

*Lock fast to make things last*



## ASBESTOS CANNOT CARBONIZE ...USED EXCLUSIVELY IN U. S. MOTORS

ASBESTOS is a fibrous rock that has not changed in character for ages. It is the only known natural fiber that is absolutely incombustible. Asbestos is the protecting element in U. S. Motor windings.

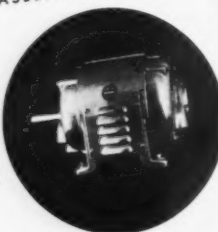
Life of a motor is proportional to the life of the insulation protecting the windings. If the insulation starts to progress, the insulation chemically and physically changes from carbonization to a conductor. Thus, destruction of the windings is threatened from failure of the very thing that was originally designed to protect them.

Materials commonly used for insulation in- clude varnished cloth, cased linen, paper, cloth varnished, insulating varnish; but all of these will carbonize. Not one of them is fire- proof. All of these, even the best, will de- grade under the temperatures at which motors are often called to operate. Repair shops, busy retooling motors, furnish proof of the continuous carbonization of most windings.

Consistent such construction with the advanced U. S. Motor method of using Asbestos as the protecting element. While there is no way of protecting motors to guarantee perpetual life, the U. S. Asbestos Process of insulating windings infinitely increases motor life. Dan- ger of breakdown is minimized.

Asbestos is the greatest of all pliable, heat- resisting materials because it cannot car- bonize. (That's why asbestos is used in automobile brakes.) Being soft and flexible it is an insulation that can be folded and worked into the windings of U. S. Motors. Asbestos is a high heat conductor. It trans- mits heat away from the inside of the motor much faster than ordinary elements.

**U. S. MOTORS**  
ASBESTOS-PROTECTED



When asbestos insulation was developed by U. S. Motors there was no manufacturing plant in the country which offered the facili- ties for processing asbestos fiber suitable for U. S. Motors application. No manufacturer of ordinary insulation was equipped, either with machinery or knowledge, to make as- besth material of the kind required, so it was necessary for the U. S. organization to devise means for processing this material.

The pure asbestos is first treated to render it moisture-proof. Sheet asbestos is cut and molded to conform with the perimetrical shape of each stator slot. Die-cut shapes are made to fit between coils and between phase windings where coil ends are used.

The impregnating compound, Asbestomix, is produced by reducing asbestos fiber rock to a very fine powder. This asbestos base is held in colloidal solution with high volatile liquid in which are dissolved all the com- pounds which are driven off after the com- pound permeates the windings. Through baking and particular curing means, the Asbestomix is hardened and forms a solid, intimately attached to and insulating every turn of windings. Asbestos protection is an exclusive U. S. Motor feature, pioneered, patented and perfected by U. S. engineers. It's the answer to long motor life. Request Bulletin.

This is part of a series of 4-color inserts developed in behalf of our client, U. S. Elec- trical Motors, Inc. For the past twenty years we have been serving as advertising counse- lers to this company. Here, as in the case of many of our other accounts, technical in- dustrial knowledge *plus* ap- plied advertising experience equips us to suit the client's story to the changing business panorama.

→ **PLANNED**  
→ **PREPARED**  
→ **PLACED BY**

If you desire *seasoned* industrial advertising counsel, call on The McCarty Company. A frank, common-sense discussion will convince you that this is the balanced advertising service that suits your demands. A call involves no obligation.

**THE McCARTY COMPANY**

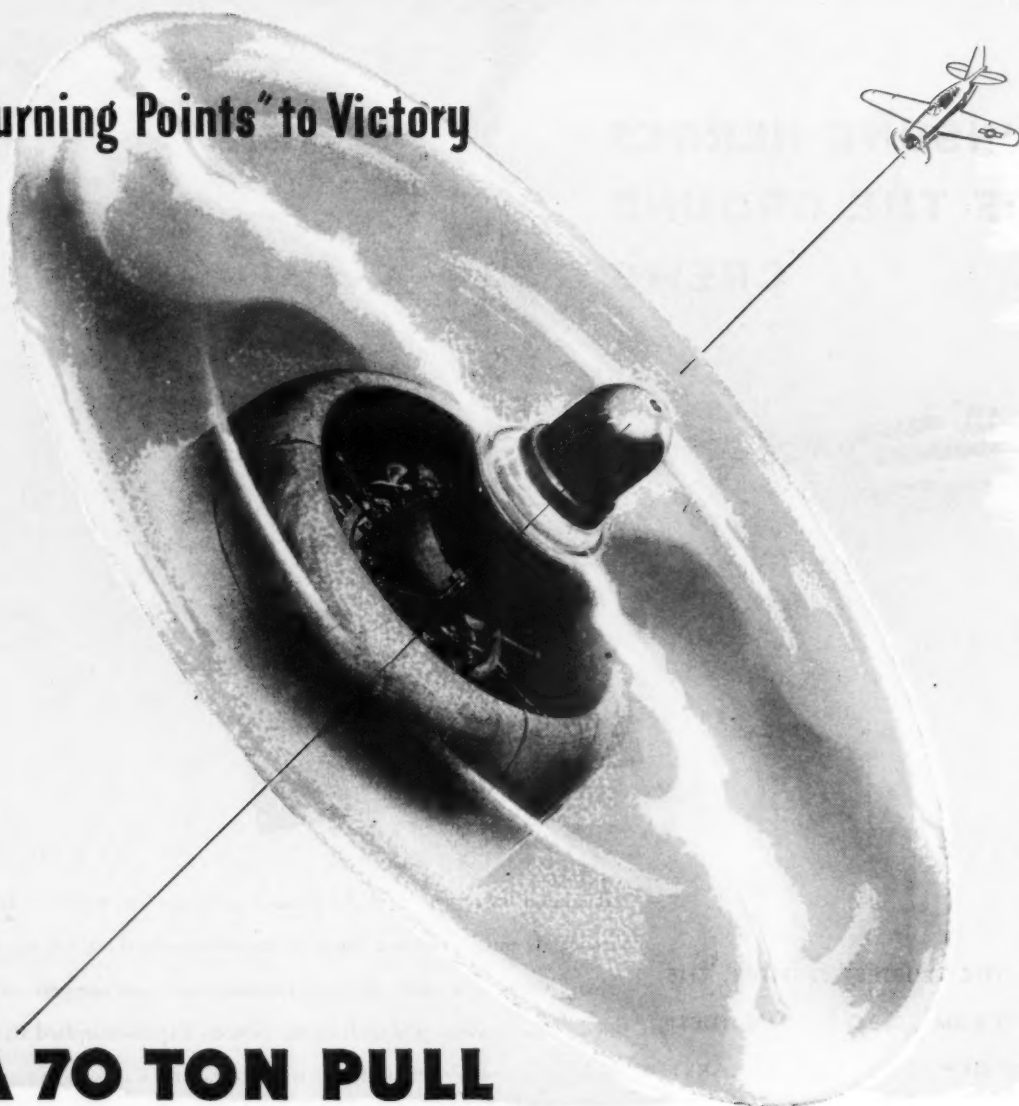
*A Complete Industrial Advertising Service Since 1919*

LOS ANGELES 15, BENDIX BLDG., PR-9132 • SAN FRANCISCO 5, RIALTO BLDG., SU-8224

MEMBER . . . AMERICAN ASSOCIATION OF ADVERTISING AGENCIES



## "Turning Points" to Victory



## A 70 TON PULL

*With its 2000 horsepower engine opened up, this 13 foot propeller exerts a pull estimated at 70 tons on the Fafnir blade bearings... a vivid example of power and speed carried frictionlessly on ball bearings.*

After the heavy raid of the American 8th Air Force on Schweinfurt, center of Germany's ball bearing industry, the official report read in part:

"These Schweinfurt plants turned out a tremendous amount of ball bearings for German war machines.

"All high speed moving parts depend upon ball bearings to eliminate friction. They must have ball bearings to operate war equipment. This

attack... amputates a huge part of the Nazi's ability to keep moving machinery in operation."

In a mechanized war, friction can be as destructive as enemy bullets. That is why ball bearings are at the "turning points" of practically every piece of fighting equipment.

Millions of Fafnirs are proving their worth in America's fighting machines and in busy industrial machines here at home. Their worth will be just as steadily proved in the machines and vehicles of the peaceful world toward which we fight. The Fafnir Bearing Company, New Britain, Conn. Branch Offices: Los Angeles... San Francisco... Seattle

# FAFNIR BALL BEARINGS



## UNSUNG HEROES OF THE GROUND CREWS



FROM THE SWIFTEST FIGHTER, THE BIGGEST BOMBER, TO THE MIGHTIEST CARGO SHIP...AIRCRAFTERS CARRY THE JIGS ON WHICH THEY ARE "HATCHED," AND CONTINUE SERVING DURING "MODIFICATION" AND MAINTENANCE OPERATIONS.

It takes a lot of work on the ground to "keep 'em Flyin'." And if the materials and parts move about on Rapids-Standard Steel-Forged casters, then the work is made easier, gets done faster and tempers stay unruffled. The Aircrafter Models of the famous Rapids-Standard Caster Line were developed for an industry which measures its loads in tons instead of pounds. They are Steel-Forged and have exclusive Rapid-Flame-Hardened swivel ball raceways. Yet for all their ruggedness, they roll with ease. Like a "sweet" motor they are always with you when you "give 'em the gun"! It will pay you to learn full details about these friends of those who get things done . . . about these casters that never ask for time off.

Write for Free Manual No 65-1C

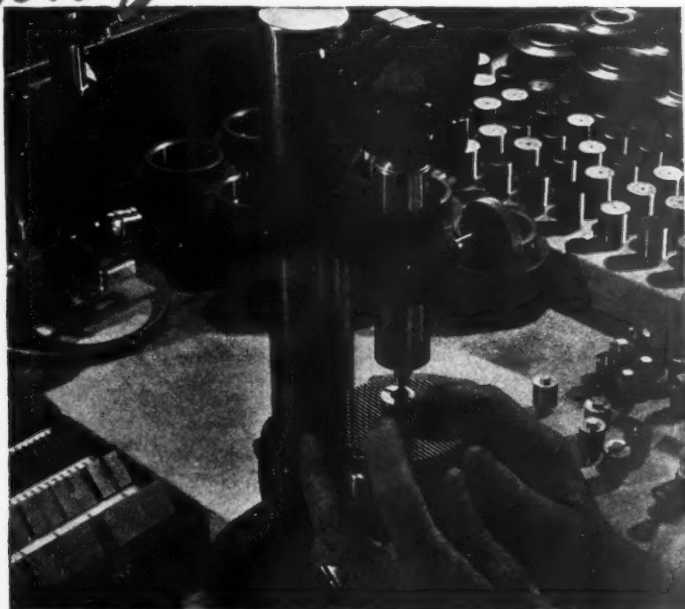
**THE RAPIDS-STANDARD CO., INC.**

5352 BOND AVE., N.W., GRAND RAPIDS 2, MICHIGAN

**Your Nearby Representatives are:**

**E. C. Beuhrer Company**  
526 Bryant Street  
San Francisco, California  
**Murry Jacobs Company**  
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**M. E. Canfield Company**  
422 East 3rd Street  
Los Angeles, California  
**Oregon Handling Equipment Co.**  
917 Terminal Sales Building  
Portland, Oregon  
**Murray Brokerage Company**  
A. Wazee Market  
Denver, Colorado

# Mobilized for War



\*\*\*\*

## Ready For Peacetime Industries

In 1939, Kobe started to expand their gage department, from a business old in precision service. By 1941, their gage production had doubled, but this was still secondary to Kobe's other manufacturing activities. Then came the war. Literally over night Kobe's facilities including men, machines and materials were converted to the war effort. Kobe combed the West for the best mechanics—obtained with War Department assistance the most modern of gage-making machinery. In a matter of weeks, gage production jumped 200%. Week by week, month by month, and if necessary, year by year Kobe will continue to expand, to develop, to increase this all-out mobilization for war.

Only when this most important need has been filled, will Kobe be able to report on the tremendous advantages resulting from this war-time mobilization. We can say, however, that in Kobe's high speed race against war-time demands every possible consideration has been given to adapting the organization in its entirety to peace-time needs. The skilled workmanship, quality materials, fine manufacturing facilities of which Kobe is proud can be converted once again, this time to gauging the products of peace. They will be tested, improved, re-tested and perfected,—production efforts all aimed at what our Nation's industries will need after the war. Gages of quality, gages in quantity—Their make? Why, Kobe, of course.



*A few of the many types of Kobe master and reference gages now being manufactured in quantity in Kobe's new controlled atmosphere plant.*



*Master and Reference*

**GAGES**

KOBE, INCORPORATED  
3040 East Slauson Avenue • Huntington Park, California

# New triple-duty Kelite Chemical

*saves on processing and handling*



## Kelite Process K:

- ① Removes scale, corrosion and light oils
- ② Insures superior plating or paint adhesion
- ③ Inhibits rusting

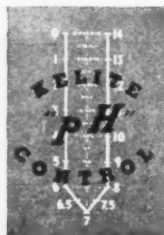
Process K has achieved particularly spectacular economies in plants finishing low carbon steel. It thoroughly removes heat treat scale in much less time than accepted pickling acids, taking off all salt

deposits as well. Not critical to handle, Process K does not attack healthy metal but leaves the surface with a tooth which is highly acceptable for painting or plating.

The action of rust is definitely inhibited by a soak in Process K. It provides adequate rust-proofing until prime coating can be applied in the normal routine of plant operations.

*Write for laboratory reports on this new time and labor saving development of Kelite pH Control*

**INDUSTRIAL CHEMICAL  
PROCESSES & MATERIALS**



909 East 60th St., Los Angeles 1, Calif.  
Manufacturing Plants in Los Angeles, Chicago, Perth Amboy, Houston  
BRANCHES IN PRINCIPAL CITIES



# Wire DOES THE JOB!

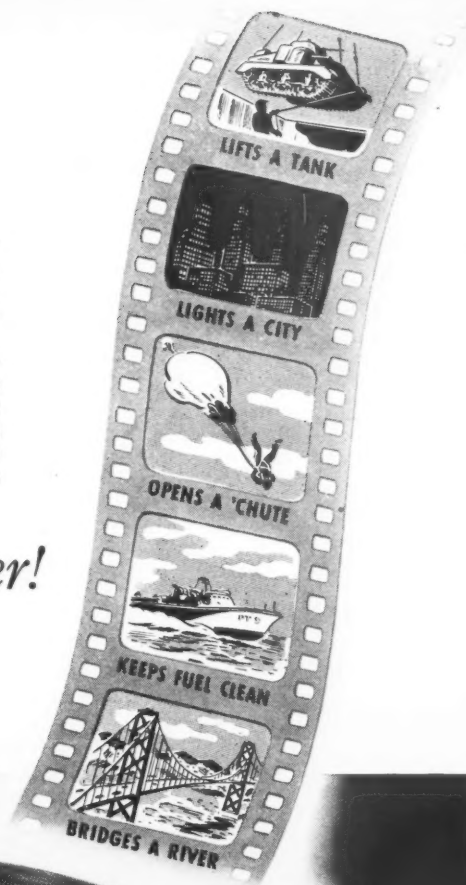
MAKING WIRE for work of this calibre is a full time job, for you must have the *know-how*...to select the right metal...roll it, or draw it through the dies to the right dimension...finish it or insulate it or strand it or weave it...and have the *equipment* to take it all in your stride...

This know-how, and the men who have it, and the thousands of tons of equipment they boss all day and all night in Roebling plants adds up to specialization, that is doing its part to win the war, and will help you afterward toward the lower costs that will protect jobs and profits in the Peace. To provide the kind of a source of supply you want when you say...

## *It's a job for the Pacemaker!*

JOHN A. ROEBLING'S SONS COMPANY  
OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland



A product of one of Roebling's six wire specialist divisions... Tempered and blued flat wire to spring specifications



# ROEBLING

PACEMAKER IN  
WIRE PRODUCTS

WIRE ROPE AND STRAND • FITTINGS • AERIAL WIRE ROPE SYSTEMS • COLD ROLLED STRIP • ROUND AND SHAPED WIRE  
AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • SUSPENSION BRIDGES AND CABLES • ELECTRICAL WIRES AND CABLES  
WIRE CLOTH AND NETTING • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS



## "He Straightens Out Our Delivery Tangles"

Keeping data "in one's head" is fine—in its place. But to keep mental tabs on all the complicated operations of a modern business would strain the powers of even a Hindu mystic!

What's needed are *records*—records of orders, of deliveries, and of every stage of manufacturing operations. Records that give complete and accurate control of all processes, all transactions.

Supplying modern record forms to business is Uarco's job. Tailored to individual needs, Uarco forms routinize complicated operations—remove the guesswork—speed and simplify the work. And because

Uarco has been doing that job for years, you can be sure that Uarco record forms, either autographic or typewritten, give you the latest, most up-to-date assistance.

If you have a special problem concerning business forms or records, bring it to Uarco. They will consider it a privilege to study your problem and to work with you in solving it with Uarco forms. Just have the Uarco representative call!

UNITED AUTOGRAPHIC REGISTER COMPANY  
Chicago, Cleveland, Oakland • *Offices in All Principal Cities*



AUTOGRAPHIC REGISTERS



FORMS FOR  
HANDWRITTEN RECORDS



FORMS FOR  
TYPEWRITTEN RECORDS



FORMS FOR  
BUSINESS MACHINE RECORDS



**BETTER BUSINESS RECORDS**



## The new P.A. learns something about buying steel from the oldtimer!

**NEW P.A.:** "I'm in a jam and need your help, Oldtimer... We've got a breakdown job and need two feet of eleven-inch round carbon steel right away... I've already tried a couple of places but they don't stock anything anywhere near that large... In fact one of them told me eleven inches is beyond the rolling mills' capacity and we'll have to have it forged... Can't wait for that... This job is hot!"

**OLDTIMER:** "I can see you haven't tried Jorgensen's, have you?"

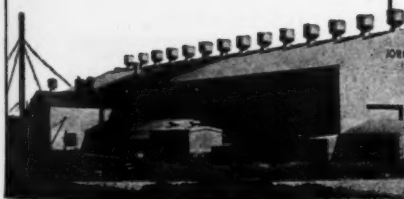
**NEW P.A.:** "No, I haven't. Do you think they can supply it?"

**OLDTIMER:** "Well, as far back as I can remember they've always carried large stocks of forged rounds—both carbon and alloy—in all their warehouses. In fact they're the only distributor I know of who carries them... Sort of a specialty with 'em... Call 'em, I'm sure they'll take care of you, especially now that they operate their own Forge Division and can replenish their stocks quickly."

**NEW P.A.:** "But wouldn't a forged bar be kind of rough?"

**OLDTIMER:** "I should have said pressed bars instead of forged bars, because they are pressed under special dies on a steam hydraulic press and are so straight and smooth you can hardly tell 'em from rolled bars... I know—I've bought 'em."

**NEW P.A.:** "Thanks a lot, Oldtimer... I'll call Jorgensen's right away!"



**EARLE M. JORGENSEN CO.**

LOS ANGELES • HOUSTON  
OAKLAND • SAN FRANCISCO



## Have you ever teamed up with a Square D Field Engineer?

They get around, these Square D Field Engineers. They're digging into wartime electrical control and distribution problems every day—working with plants of *every size and kind*. They study methods and applications with the idea of simplifying new jobs or doing old ones better. That is vitally important work during these days when the production front is facing its greatest test. It is equally important in planning now for speedy conversion the day peace comes.

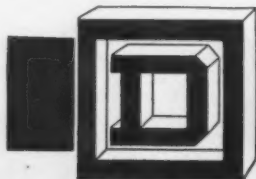
If you have a problem involving electrical control or distribution, call in the nearest Square D

Field Engineer. Backing him up in every Square D plant, are design and engineering specialists with complete research and testing laboratories at their command.



*Wherever Electricity is  
Controlled or Distributed*

SAFETY SWITCHES ★ CIRCUIT BREAKERS ★ MOTOR CONTROL  
★ SWITCHBOARDS ★ SQUARE DUCT ★ PRESSURE SWITCHES  
★ PANELBOARDS ★ MULTI-BREAKERS ★ WELDING CONTROL  
MILITARY, MARINE AND AIRCRAFT ELECTRICAL CONTROL



ELECTRICAL EQUIPMENT • KOLLSMAN AIRCRAFT INSTRUMENTS

# SQUARE D COMPANY

LOS ANGELES 21 • SAN FRANCISCO 3 • DENVER 4  
DETROIT • MILWAUKEE





# Piping Pointers

## FOR INDUSTRIAL MAINTENANCE MEN

New 16-mm.  
Sound Film  
Full of Valuable  
"KNOW HOWS"  
For Trainees and  
Veterans

### Now being shown **FREE** in any plant

**S**EEING this film gives maintenance trainees a quicker grasp of their jobs—a better understanding of various types of valves and fittings—how they are used and installed to insure long life and good performance. In addition, "Piping Pointers" explains correct maintenance procedures—shows how to conserve time and materials on the job.

Because "Piping Pointers" is packed full of authentic and practical information—because its ultimate benefit is better service from piping equipment—numerous plants are showing it to both trainees and veteran workers.

### New Training Manual Included

Making "Piping Pointers" even more effective, is a new comprehensive training manual which covers in greater detail each subject treated in the film. It can be used with the film or separately.

Both the film and manual are the first of their kind ever compiled. But more important is that each lesson they give can be fully depended on as the best information available. For their content is based entirely on Crane Co.'s 88-year experience as the leading maker of valves and fittings.

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# Pumps

# Spotlight on the NEWS

**WESTERN INDUSTRY**  
**FOR FEBRUARY, 1944**

VOLUME IX NUMBER 2

## San Francisco Facilities

San Francisco Bay area has had by far the greatest government investment for government facilities during the war period of any locality in the country, according to the first detailed breakdown issued by the War Production Board. The amount up to Sept. 30, 1943 was \$1,808,000,000, practically twice the amount spent in the second area, Chicago. Los Angeles ranks second in supply contracts and project orders, topped only by Detroit, with the San Francisco Bay area seventh and Seattle-Tacoma eleventh.

The figures in round numbers are as follows:

	Supply contracts and project orders to Oct. 31, 1943	Facilities to Sept. 30, 1943
Detroit .....	\$11,542,000,000	\$592,000,000
Los Angeles .....	8,502,000,000	392,000,000
Chicago .....	8,319,000,000	994,000,000
Newark-Jersey City .....	8,020,000,000	473,000,000
New York City .....	5,948,000,000	403,000,000
Philadelphia .....	5,564,000,000	475,000,000
San Fran. Bay area* ..	5,360,000,000	1,808,000,000
Cleveland .....	4,156,000,000	250,000,000
Boston .....	4,014,000,000	277,000,000
Buffalo .....	3,705,000,000	287,000,000
Seattle-Tacoma† .....	3,685,000,000	246,000,000
Baltimore .....	3,399,000,000	153,000,000
San Diego .....	2,708,000,000	185,000,000
Hartford .....	2,551,000,000	126,000,000
Norfolk-Newport News ..	2,057,000,000	345,000,000

\*Includes seven counties; San Francisco-Oakland alone \$2,885,000,000 of supply contracts and project orders and \$460,000,000 of facilities. †Includes Bellingham and Bremerton.

Detailed figures for each of the eleven Western states for supply contracts may be found in the statistical department in this issue (page 53).

## Coast Gains Still More

A net gain in population from March 1, 1943 to Nov. 1, 1943 of 391,523 population in the three Pacific Coast states is indicated in a survey as of the latter date made by the War Production Board, based on ration books. The March 1 estimate was made by the U. S. Census Bureau. Arizona, Nevada and Idaho showed a loss of 53,019

for the same period. The figures are as follows:

	Population Nov. 1, 1943	Gain or loss from March 1
California .....	7,814,676	+ 343,448
Oregon .....	1,166,388	+ 13,896
Washington .....	1,882,434	+ 34,179
Arizona .....	549,662	- 29,094
Nevada .....	127,182	- 9,507
Idaho .....	453,149	- 14,418

## Alumina Plant Starts

A 100-acre tract just north of Salem, Oregon, has been purchased for the new \$4,000,000 alumina from clay pilot plant which will be built for Defense Plant Corporation by Chemical Construction Co., an affiliate of American Cyanamid. Columbia Metals Corp. will operate the plant. W. B. Schoelkopf is the Chemical Construction engineer on the job.

## Naval Ordnance Depot

Anaheim Bay and Anaheim Landing—a beach colony on the Southern California coast—will be the site of a \$20,000,000 naval ordnance depot.

Bridges will be ripped down, 200 homes will be razed, the channel will be dredged to a 15-foot depth and the Federal government will acquire 3500 acres of land by negotiation and condemnation.

The Navy establishment will be permanent, with 2025 employees in peacetime.

## Alcohol From Wood Waste

The first commercial plant in the country to produce alcohol from sawdust and wood waste is to be erected by the Willamette Valley Food Distillation Company at Eugene, Oregon, as soon as its application to the government is approved. The estimated cost of the plant is \$3,600,000. A rumored grain alcohol project vanished.

## Civilian Manufacturing

There is talk in Washington that a limited number of automobiles may be produced for civilians late this summer, and that the Pacific Northwest is regarded as a probable production center for automobiles. The entire Coast is considered by these Washington observers as a base for production of airplanes for air lines, and Southern California is expected to be an important national center for the production of household appliances, and railway equipment.

In order to balance the inequities between the Eastern manufacturers who may be released from war work and the Western producers who might be held to war schedules, it is proposed allocations of materials and quotas shall be made on the prewar basis to all.

The Western manufacturers would be permitted to subcontract their quotas, and would thus be able to maintain their brands and their distribution in competition with those who no longer have war work. They even may be permitted to subcontract their quotas to the Eastern plants. The plan is being tried out in the production of the 2,000,000 electric irons.

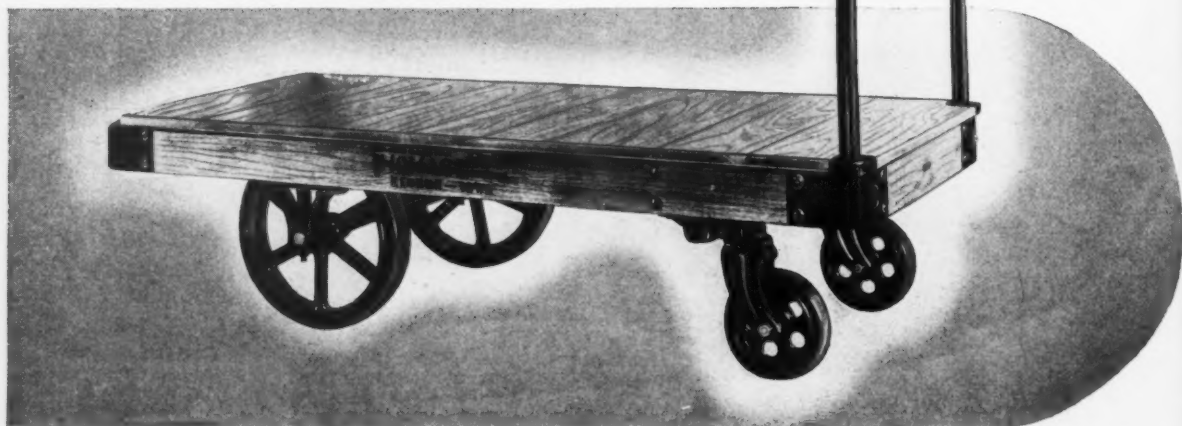
## Montana Post-war Program

A \$70,000,000 postwar public works program, designed primarily to aid private industry in providing jobs for returning veterans and give the state needed improvements, has been drafted by the Montana planning board.

In addition, state agencies are co-operating with the federal government on two water conservation projects, the Hungry Horse dam on the South fork of the Flathead River near Kalispell and the Canyon Ferry dam on the Missouri River near Helena, to cost \$75,000,000.



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*This series 3400 round cornered truck will fit 80% of all jobs because it can be equipped with a superstructure your load requires.*

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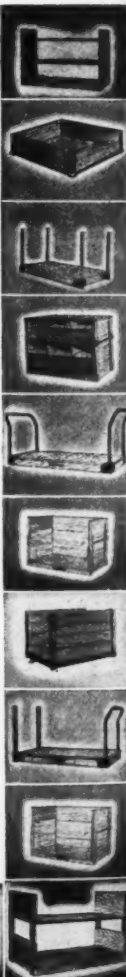
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Metal and rubber and leather in a dozen types and in hundreds of sizes.





February, 1944

## WESTERN INDUSTRY

# WESTERN WAR JOB GROWING HARDER

• This 40-ton recovery unit made by Pacific Car & Foundry takes aboard a 30-ton tank, travels 30 m.p.h. and goes up 30% grades.

**I**T WILL be harder, not easier, for the West to face the demands of war from now on. Instead of tapering off gradually, with an opportunity to slip into civilian production bit by bit, the pressure for greater output of war materials will very evidently become heavier.

If manpower utilization improves further, a margin of labor supply may appear that will permit the West to participate to some extent in the resumption of civilian manufacture. The pressure exerted by the West Coast Manpower Program already

has revealed previously unadmitted possibilities in utilization. But on the other hand, there may be unexpected war demands that will absorb the margin overnight.

Industrialists from the Western states who were invited to the Army-Navy War Conference in Los Angeles, January 7 and 8, got a very sobering reminder from top-notch admirals and generals that the war is no pushover from here on in. These leaders in the armed services did not particularize on the nature of the war demands

for this year and next, although the Undersecretary of War, Robert Patterson, said very plainly that there would be no lightening of war production in the Western area.

But some events of the last few months themselves indicate that the West needs to be prepared for any eventuality in production. Earliest among these was the sudden revision of the tank program, which chopped off a widely-spread number of sub-contracts, both in southern California and in the Seattle area. These sub-contractors

• Air raids: North American's P-51 Mustang fighter (below) first went into action Jan. 5 on a raid deep into Germany. Invasion: Pacific Coast yards are up to their ears in landing craft jobs. Soule Steele Co. build the barge type shown here. (U.S.C.G. photo.)



generally found occupation with aircraft parts or other war items.

While this revision of the tank program was due largely to the oversupply of tanks, it also was linked with the discovery that the Army was sadly lacking in heavy trucks, despite a profusion of medium and light trucks. In particular need were tank recovery units, that could lift aboard a damaged tank and swiftly transport it to a repair depot, or similarly cut the traveling time of serviceable tanks to new points on the battlefield as the scene of action changes. It resulted in Billings, Montana, suddenly becoming an assembly point for Pacific Car & Foundry of Renton, Washington.

### Costly Lesson

Next came the concentration on fighter planes, following the loss of 60 bombers in the Schweinfurt raid due in large measure to the fact that the fighters then in use did not have long enough range to stay with the bombers until they were most needed. After the Schweinfurt encounter with Nazi fighters equipped with rocket guns, the southern California airplane industry, in the words of one important WPB official, was virtually turned upside down.

Nothing much was said about it publicly, except that Lockheed and North American were concentrating on fighters. Now have appeared improved P-38s, the Mustang P-51s and the Northrop Black Widow, with extra drop tanks and other features to overcome the previous handicap.

Third was the vastly multiplied production of landing craft. Experience in the Pacific and Mediterranean uncovered the fact that the original program was inadequate, because landing craft run on the ferryboat plan can not meet the needs of the situation. Landing forces cannot afford to get their deliveries of men and equipment on an installment basis. It is more a case of a ship for each tank, with big margin of extras to make up for the many sinking, smashups, bombings and all the other hazards, to say nothing of having enough craft ready to handle any size of landing that the Army decides to undertake.

The outcome of this discovery was a rush of orders to establishments on both Pacific and Atlantic coasts for landing craft of various types. Obviously a landing on European shores will require a tremendous number; even the surprise landing on the Italian coast near Rome probably took far more craft than would have been thought necessary six months ago.

"And what if we should be defeated when we land in Europe? What then?" Western Industry was asked by the same WPB official quoted above. "We may have to turn our hands to producing something now unthought of, and in vaster quantity."

Very likely many of the industrialists who heard the inside story at Los Angeles of what we face in Europe and the Pacific, may have thought likewise, and cogitated

long on the immense production problems entailed by such changes as the three already mentioned and the others that may lie before us, particularly if we suffer delays, reverses, or both.

Consequently the surplus of aluminum, steel, copper, magnesium, hardware, machine tools and the like, now piling up to the consternation of industry generally, may suddenly be wiped out by unexpected turns of events.

### Civilian Will-o'-the-Wisp

Hopes for resumption of a certain amount of civilian manufacture are not entirely inconsistent with the war situation, despite the discouraging words of Donald Nelson, because the civilian economy has to be kept from wearing out. But how to get people back into the manufacture of flat irons, washing machines, dishpans and the like without giving an individual, a firm, or a locality too much of a break, too much of a headstart toward the peace-time set-up is a problem that worries WPB officials all the way from Honolulu to Washington and back again.

Area production urgency committees are coming closer to grips with the manpower situation. In northern California, 73 applications for manufacture involving \$10,126,229 and 463,240 man days of labor were unfavorably recommended by the committee, with only two appeals made from the decisions. In the Los Angeles area, continuance of the present aluminum industry was recommended to Washington, following an extended investigation by a subcommittee of military and civilian production experts.

Local production of aluminum extrusions and forgings is less than required by

### The War Program

Chief cutbacks during the coming months, according to military and civilian war agencies, will come in small arms and ammunition, tanks, certain types of anti-aircraft equipment, non-combat aircraft, and artillery fire-control equipment.

More than offsetting this will be an almost doubled production of combat aircraft, with greatly increased emphasis on bombers, a tripled requirement for high-octane gasoline, and other expansions in merchant shipping (an estimated 1,000,000 deadweight tons), trucks (about 50 per cent), electronic equipment, heavy guns, heavy artillery shells, ground ordnance, and signal items.

The Navy says that its portion of the over-all program for 1944 will be almost one-third greater than during 1943—totaling nearly \$16,000,000,000 as against \$12,000,000,000. Navy schedules require a sustained output through the next 12 months at about the rate achieved in the peak production month of December 1943.

The Navy shipbuilding program calls for completion in 1945-47 of more than 500 combat ships, about 400 patrol and mine craft, over 600 auxiliary vessels and more than 70,000 landing craft.

aircraft factories, and some importing from the east has been necessary, it was found. On some items for aircraft, plants are dependent on hourly delivery of parts and the time lag is seldom more than 12 hours, consequently with the pressure now for more fighter planes the committee felt the risk of interruption because of slow transportation from the east could not be afforded.

The committee reported that closing southern California plants would further burden the already-overtaxed transportation lines to the West, and would release little manpower to other local war industries because skilled workers imported from eastern areas show an inclination to return home rather than transfer to new lines of work.

It further recommended that serious efforts be made to step up output of the fabricating or extrusion plant at Phoenix, and that a study be made with a view to eliminating cross movement of aluminum pigs, ingots and billets between eastern points and Los Angeles.

### Pressure on Shipyards

Signs of pressure developing to force better labor utilization in the shipyards are seen in the stand of the San Francisco Chamber of Commerce, recommending that labor utilization studies in northern California be undertaken to determine whether labor hoarding exists and what steps can be taken to get greater labor efficiency.

Immediate damage to the war effort by the molders' strike in the Pacific Northwest was avoided by the unions making provision for protecting Boeing production. Long range affect is something else, of course.

Boeing, once the second worst bottomless sump in the Northwest for swallowing up labor—the Puget Sound Navy Yard being the first—had by the first of the year so adjusted its wages and working conditions as to have had a net gain of 6,510 workers in its Seattle and Renton divisions and in the six branch plants established last fall in western Washington. The navy yard now has more than 30,000 workers, and needs only 6,000 more to man the yard to capacity.

The threat of a national service act, contained in President Roosevelt's message to Congress and his radio broadcast in January, had no effect on the manpower situation on the coast. Both management and labor have been opposed to it all along, and the coast WMC offices advised their staffs to disregard it as far as having any immediate consequences were concerned.

In the Los Angeles area, further steps to provide manpower are included in a prospective reduction of 10 per cent from the October payroll in maximum employment for concerns classified as less essential. This would not apply to the first 49 on the production urgency list nor to those listed as locally essential.

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• Loading magnesium ingots. Although light, the new ingots are still hot, hence the big asbestos gloves. (OWI photo)

## Nevada Magnesium Plant World's Largest Electro-Chemical Unit

**L**AID on the West's doorstep by the urgency of the war demand for development of strategic materials is magnesium. Newest of the light metals, it is already in extensive use for aircraft, bomb casings, incendiary bombs, flares, tracer shells, tracer bullets and other implements of war. Because of its lightness—it is one-third lighter than aluminum—it may become an uncomfortable future competitor of aluminum and brass for many peacetime uses.

The need for it has resulted in the ex-

penditure of more than \$140,000,000 of Uncle Sam's funds for construction of the largest electro-chemical plant in the world, on the desert slopes back of Las Vegas, Nevada. This was done despite the fact that the government already had financed the immense Dow Chemical Co. sea water process magnesium plant at Freeport, Texas, Henry Kaiser's Permanente Corporation factories in California, and other smaller producing units.

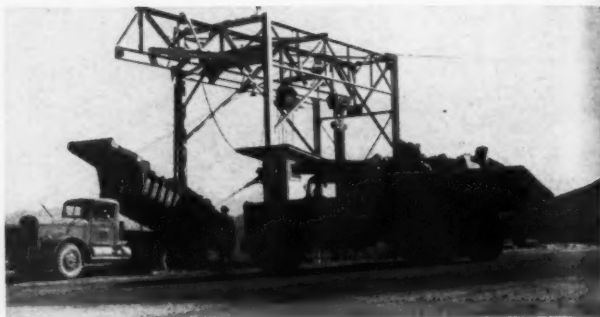
Origin of the project resulted when Major Charles J. P. Ball, an Englishman

who had acquired German patents about 1935 and successfully developed the molten electrolytic process with European magnesite ore, joined forces with Howard P. Eells, Jr., of Basic Refractories of Cleveland. The latter had discovered rich magnesite deposits adjoining his brucite claims in Nevada. Major Ball's purchase of patents from I. G. Farbenindustrie was made before the Nazi war machine had gotten into high gear, when British and German leaders were still trying to cement business and political relations. He improved the





• At the Gabbs mill, magnesium oxide from the mine is calcined in seven-story building at the left. Flotation plant at the right while the silos store the processed oxide. Below at left are dust-tight hopper-body trailers which transport it to the railroad. At right, ore trucks dump twenty tons of rock into the primary crusher. Conveyor transports crushed rock into the mill.



process and up to 1941 his company, Magnesium Elektron, Ltd., was the largest producer of magnesium outside of Germany.

Eells and Major Ball organized Basic Magnesium, Inc. and in April 1941 proposed to the government that they be given opportunity to lease and operate a plant to be financed through the Defense Plant Corporation. Eells sent 45 American engineers to England to work in plants of Major Ball's company, and six months later ground was broken at Las Vegas.

Anaconda Copper Mining Company, whose long experience in mining and smelting fitted them to come into the picture logically, purchased Eells' stock. Anaconda now have 52½ per cent of the shares, their Nevada attorneys, Thatcher & Woodburn of Reno, hold 2½ per cent and the remaining 45 per cent is in the

hands of Magnesium Elektron, Ltd. Anaconda installed as manager F. O. Case, who had been manager of their East Chicago zinc plant, but comparatively few personnel changes have been made on the whole.

Both Dow and Basic use the electrolytic method of making magnesium, rather than the thermal distillation type, which is employed in the Permanente plants in California. The difference between the Dow and Basic processes is described by Major Ball as follows:

"Dow discovered initially that they had a cheap raw material in the  $MgCl_2$  liquor residue from their brine treatments at Midland, Michigan, and ascertained how to reduce it to an almost anhydrous condition by using dry hydrochloric gas and then developed a cell capable of electrolyzing this salt. At Freeport they precipitate magnesia from salt water by the use of lime, which is then converted to hydrous magnesium chloride by the addition of  $HCl$ , reduced to the almost anhydrous condition and used as the electrolyte in the cells.

"The process used by Basic Magnesium, Inc. differs insofar as this is a closed circuit process, using completely anhydrous magnesium chloride. The magnesite ore is beneficiated and calcined to give it a high degree of porosity and fed into chlorinat-

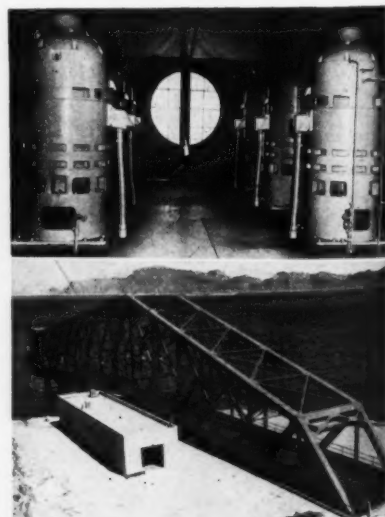
ing furnaces in which the magnesium oxide is reduced to absolutely anhydrous  $MgCl_2$ , the electrolyte for the cells.

"The current splits the salt into the  $Cl_2$  which comes off the anode and is filtered and recirculated. The metal floats to the surface at the cathode and is dipped out. This metal, which can be as high as 99.85 per cent pure, depending upon the skill of the operator, with the remaining  $MgCl_2$  is taken to a refinery, where it is cleansed and alloyed simultaneously, using special fluxes."

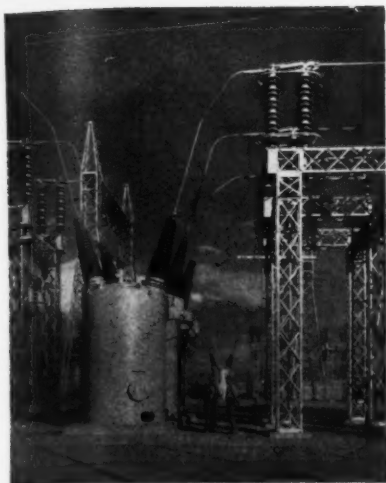
Magnesium is hexagonal holohedral in its crystalline form; the melting point is 1204 deg. F.; coefficient of expansion at 68 deg. F. is  $24.34 \times 10^{-6}$ ; modulus of elasticity is  $6.5 \times 10^6$  per lb. per in.; modulus of torsion is  $2.6 \times 10^6$ ; electrical conduc-



• (Left) For the first time in history, magnesium oxide is recovered by flotation. Oils are introduced into these large vats, the slurry is agitated and the oil brings the oxide to the surface in bubbles, to be scooped off. (At right) Pumping station at Lake Mead, with battery of lift pumps.







• Nine 110-ton transformers, the world's largest, distribute 330,000 volts of current.

tivity is 37.8 per cent of copper standard; thermal conductivity is 44.4 per cent of the copper standard.

Now in full production, Basic Magnesium, Inc., who operate the Las Vegas project under Defense Plant Corporation contract, has surpassed Dow's output. Basic's capacity is many times the world's entire output six years ago. Taking into account the other Western tonnage, it is apparent beyond question that the West has become the primary magnesium producing area.

"BMI" would be remarkable for its size alone. But the project becomes even more remarkable by virtue of the fact that it reached 50 per cent of full production in 17 months after being started and full production in 22 months, notwithstanding the fact that it was built on the desert far from any habitation, with every bit of equipment, supplies and housing facilities having to be shipped in from all over the United States.

Ground was broken in October 1941 and ten months later, in August 1942, metal was being made. Eleven months later 100 per cent operation was reached. In that period the site had to be prepared, buildings erected, water and power brought in, housing facilities for thousands of workers constructed, and equipment and supplies selected, shipped in and installed. Nearly three times as many men were employed in construction as at Boulder Dam, the total payroll in July 1942 being 13,618, as compared with a peak of 5,200 at Boulder.

Las Vegas was chosen as the locality because it provided the only practical combination of sources of magnesite ore, water, electric power, salt and coal in sufficient quantities to justify a plant of this size. The water and power are transmitted less than 25 miles, the salt about 100 miles from the Amboy district on the Mojave

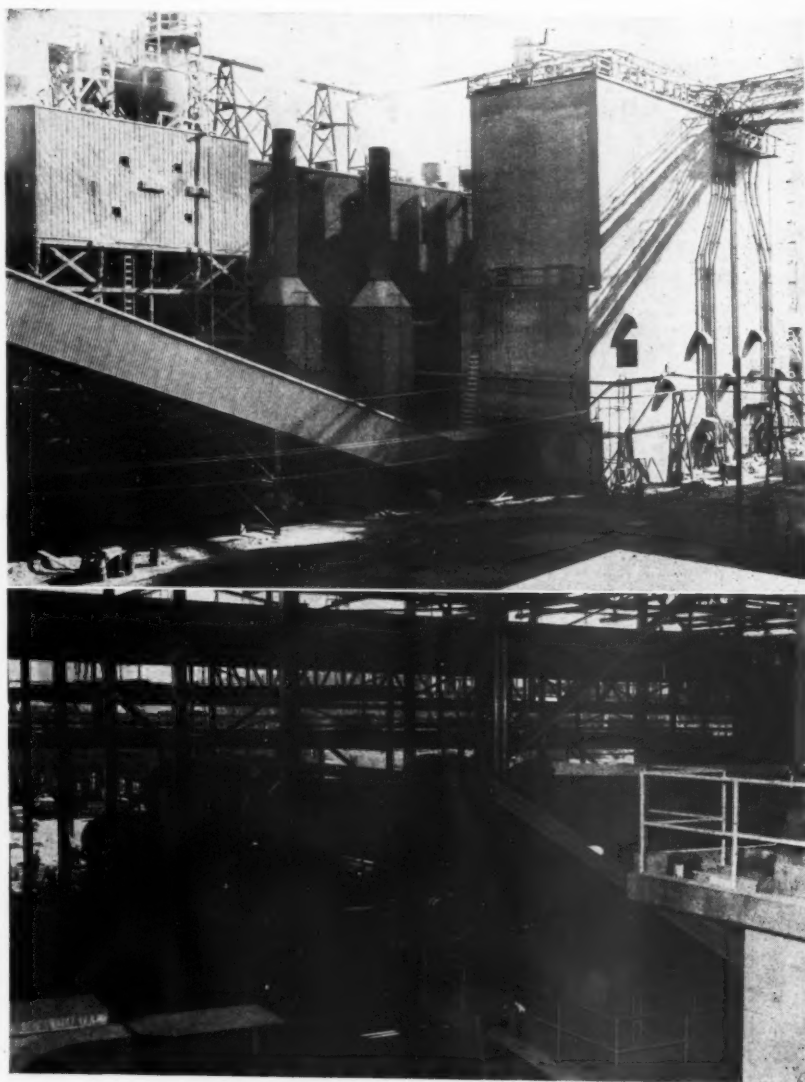
desert in California and the coal 200 miles from Castle Gate, Utah, the last two by direct hauls to the BMI spur tracks at the plant. Peat moss, another ingredient, comes from New Westminster, B.C. Propane fuel for the refinery furnaces is trucked from the oilfield of Kern County, California.

The magnesite ore is mined at Gabbs Valley, in the area between Tonopah and Reno, and is hauled a long distance at the present time, being detoured 1,000 miles by rail via Salt Lake City from Luning because of lack of highway trucking facilities due to the rubber shortage. This could be shortened to 300 miles either by use of trucks entirely or by extending the old Tonopah and Goldfield Railroad to Las Vegas.

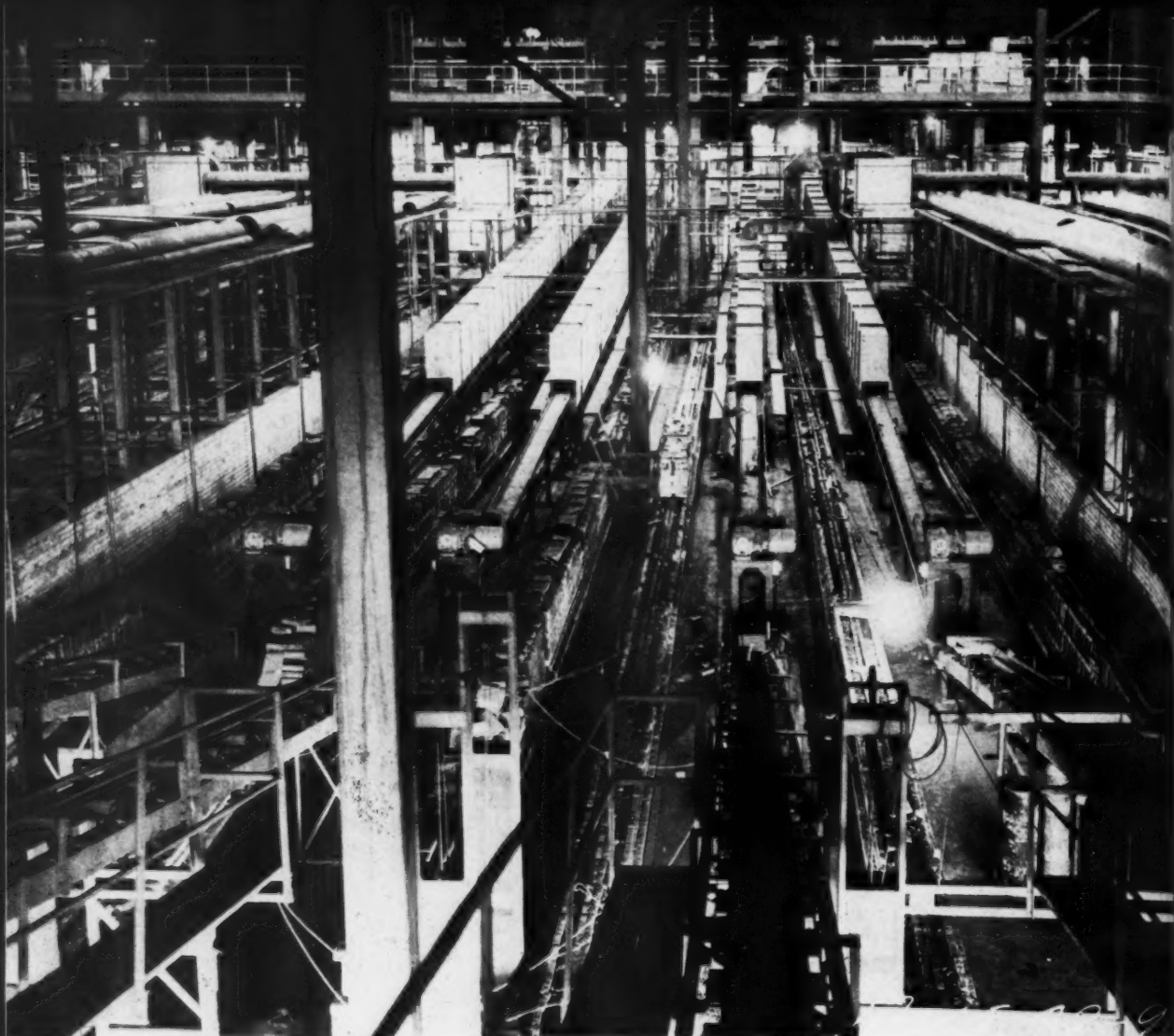
But the ore transportation difficulty will disappear entirely if dolomite ore, available in unlimited quantities within 18

miles of Basic, is substituted for magnesite. Dolomite tests, which the U. S. Bureau of Mines has pronounced successful, are being run at a  $\frac{1}{4}$ -ton pilot plant at the bureau's experiment station at Boulder City, and a 20-ton pilot plant may be set up eventually by the bureau at the BMI plant, to provide testing conditions more nearly comparable to commercial practice.

Power is only being supplied on a three-year contract basis, because the entire output of Boulder Dam was contracted for long before BMI appeared on the scene. Other applicants who were not engaged in war production waived their rights temporarily, but after the war BMI will have to find power from some other source. This is not necessarily a serious problem, because the projected Davis Dam near Needles, construction of which is being held in abeyance, will provide 200,000 horse-



• Above are to be seen an exterior and interior view of the preparation plant. Upper picture shows a small part of the operation. Size of the installation is indicated by contrast with men in lower right hand corner. Interior shows portion of drying kilns.



• Kiln drying area of the preparation plant, photographed before completion. Concentrates received from the mill at Gabbs are mixed in the form of cakes with coal, peat moss and magnesium chloride, and then conveyed on cars through the tunnels. This process consumes some of the coal and peat moss, leaving the cake porous. Cakes are then crushed before chlorinating.

power, and there are various other undeveloped power sites above Lake Mead.

When the ore is brought out of the mine at Gabbs, it is put through primary and secondary jaw crushers, ball mills and screens, concentrated by the flotation process into magnesium oxide and calcined in huge ovens. Then it is dumped into hopper-bodied, dust-tight trailers and trucked 33 miles to Luning, to be transferred to paper-lined box cars.

In the preparation area at Las Vegas the calcined magnesite and powdered raw magnesite are stored in a bin storage and proportioning building along with the coal dust, and shredded peat. Each of these raw materials is stored in separate bins. Each bin discharges through a waytroll onto a conveyor belt common to all bins. The raw materials, now properly dry mixed and proportioned, are carried by this conveyor into the preparation building where they

are mixed with water and formed into pellets or briquets.

The pellets are then run through rotary kilns for dehydration, and the briquets are broken into small pieces and along with the pellets are transported in special containers to the chlorination buildings.

Each chlorination building contains eight large electric furnaces having a steel shell 25 feet high and 8 feet in diameter. Each shell has an 18-inch inner lining of acid resistant firebrick laid to a maximum tolerance of 1/32 of an inch. The pellets and pieces of briquets are discharged from the special containers into the furnaces and melt, at temperatures up to 2000° F., on a bed of loosely packed resistor blocks in the bottom of the furnace. Pure chlorine gas rising through the resistor blocks reacts with the pellets to form anhydrous magnesium chloride which accumulates in the bottom of the chlorinator furnace and is

tapped off at intervals into tilting crucibles mounted on small power-driven trucks.

Immediately upon being tapped from the chlorinator furnaces the  $MgCl_2$  is transported to electrolysis buildings and poured into the specially designed electrolytic cells. Each building contains 88 cells; each cell being a steel shell approximately 10 feet long, 8 feet wide, and 5 feet high, lined with 12 inches of acid resistant firebrick. The cell is divided into seven compartments, three anode compartments and four cathode compartments by semiwalls of arch brick.

In the cells a strong electric current, carried by bus bar from either rectifier or motor generator buildings, is passed through the anhydrous  $MgCl_2$  and separates the magnesium from the chlorine. The magnesium floats to the surface while the chlorine passes out through a gas-tight

chamber around the anode and is filtered for re-use in the chlorinator furnaces.

The method first used of cooling the magnesium into cheeses and then transporting it to the crucibles for remelting is being replaced by the use of 12 hot-metal cars mounted on standard truck axles which carry the molten magnesium direct from the cells. These are literally big thermos containers, holding two tons of molten magnesium each, having inner and outer shells of sheet steel with five inches of insulation material between, which will keep the magnesium fluid for several hours.

After alloying, the crucibles are placed in propane gas heated refinery furnaces and the metals heated to the desired temperature and held at this temperature for the time required by the various alloys.

From the furnaces the crucibles are lifted by overhead traveling cranes and placed in crucible tilting machines. Here the molten metal is poured from the crucibles into ingot casting machines. The ingots are then stacked, strapped and ready for shipment.

Electric power for the operation of the plant and its facilities is transmitted through a 23-mile line from the Boulder Dam powerhouse, with a duplicate line as precaution against breakdowns. The line carries 230,000 volts, distributed to the plant by nine 25,000 KVA transformers, weighing 100 tons each. They are the largest ever built and several western railroads had to widen their clearances to let them go through. The plant is the largest single industrial consumer of Boulder Dam power.

To pump the plant's water from Lake Mead, it was necessary to build a 400-foot cantilever pier, extending approximately 300 feet out over the lake and 25 feet above the surface at high water. Six 190-foot deep well pumps are driven from motors on the pier, lifting the water to a booster station 250 feet higher up. The intake capacity is 26,400 gallons a minute. From the booster the water is lifted 630 feet over the mountains through a 40-inch pipe line to the plant, 14 miles away. Current daily consumption of water at the plant is more than 20,000,000 gallons.

More than 6,000,000 lbs. of copper busbar were installed in the plant. Due to the scarcity of copper, \$23,000,000 of sil-



• Chlorine must be manufactured before magnesium, so it is extracted from brine by electrolysis in these cells, nine hundred of them in all. Caustic soda is a by-product.

ver, loaned from the government's silver coinage store, was also used for busbars.

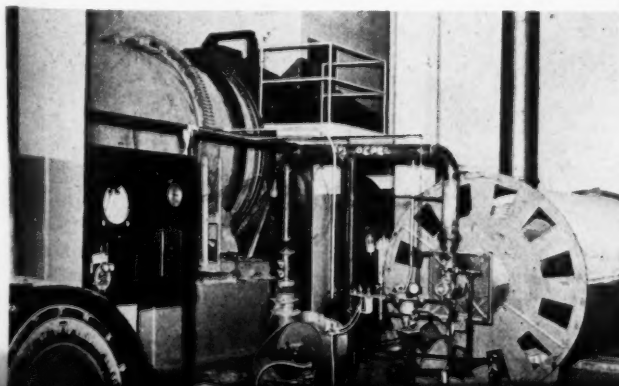
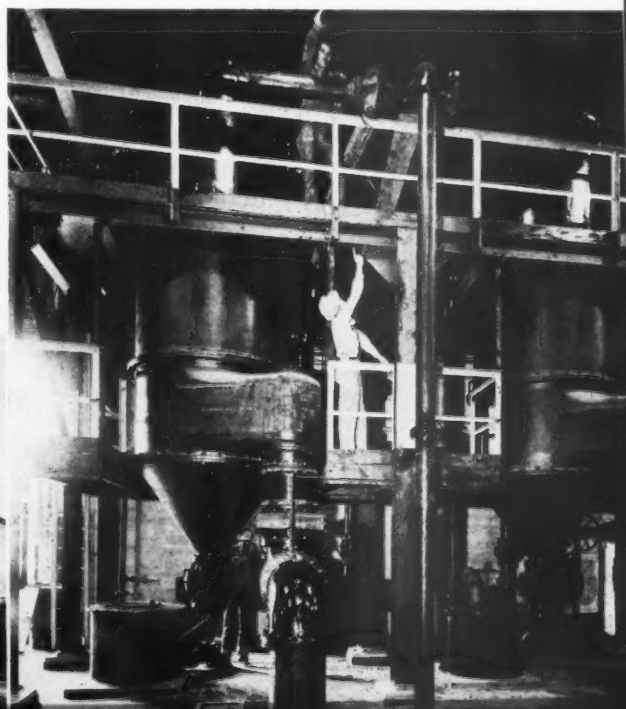
Some additional quantities of material used in constructing the plant will give an idea of the immensity of the project. As many lineal feet of structural steel as were required for the Empire State Building in New York City (about 50,000 tons, or 1,000 carloads); 40,000,000 feet of lumber, 320 miles of pipe, one installation taking 7,000 tons of cast iron pipe; 22 miles of glass tubing; 200 carloads of paint delivered at the rate of 1,100 gallons a day in July, 1942. More than 14,000 carloads of materials were required in all, and at the peak construction period cars

arrived at the rate of 122 a day. An instance of the speed at which construction proceeded is that of the complete rebuilding and occupying of 56,000 sq. ft. of administration and engineering offices in 146 hours following a fire. The office was of wood frame construction.

Housing was a major problem that had to be solved along with building the plant, as the towns of Las Vegas and Boulder City could only provide for a small proportion of the thousands of men and women employed. Facilities that would make living in the summer heat comfortable were essential.

Accordingly a townsite was laid out and

• Below is a rotolouvre dryer for reducing the moisture content of inorganic salts. Pictured at right is a chlorine bag filter hookup.



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• Chlorinator being charged. Raw material pellets from the preparation department are lifted to the fourth floor of the metals unit by overhead conveyors, lowered to top of chlorinator and tripped, the pellets falling into electric furnaces where the introduction of chlorine transforms the magnesium oxide into magnesium chloride.

1,000 semi-permanent plywood houses erected and equipped with desert coolers, electric refrigerators, electric stoves and electric water heaters. Green lawns and victory gardens are now appearing, and residents of the townsite assert that the community looks better than Boulder City in its early days. The latter, which houses largely employees of the Los Angeles Bureau of Power & Light, the U. S. Reclamation Service and the U. S. Bureau of Mines is a beautifully laid out residential community with choice bungalow homes, lawns, gardens and trees.

Nearing completion are 824 concrete block dwelling units, of which 324 are for colored B.M.I. employees. They are of the zero, one, two and three bedroom types. Besides these homes, 495 hotel-type rooms in dormitory buildings are going up, 320 for white workers and 175 for colored. Total facilities at the townsite will accommodate 4,300 people, and permanent employment at B.M.I. is estimated at 5,500. Some employees live in Vegas and Boulder; others in settlements that have sprung up on the road to Las Vegas.

Capacity of the construction camp adjoining the B.M.I. townsite was 4,000, the accommodations consisting of 1,800 tents and 2,200 dormitory rooms, all air-conditioned in summer and heated in winter. The company provides a thoroughly equipped and highly comfortable 60-bed hospital in a concrete block building.

In the townsite is also a school built for 600, but already taking care of 1,500 children, who are on a two-shift basis until additional facilities, now under construc-

tion, are completed. An excellent food market, stores, theatre, recreation hall, post office, etc., have been constructed.

Magnesium's future as a permanent western manufacturing industry is a bright one, if the western industrial community is alert to the need of keeping it here. It has sprung into being without any ties of fabricating plants such as have tended to hold other manufacturing industries in the East.

Establishment of one or more fabricating plants in the western area would be a primary step in holding the industry in the West. Development of by-product industries, using the chlorine and caustic required for producing magnesium by the

electro-chemical process would anchor it still more firmly.

Apparently nothing has been done yet. The situation is comparable to the aluminum industry, where fabricating plants are springing up in the East, although the aluminum itself is largely being produced sheets, rods and bars would seem to be in order.

No less a person than A. W. Robertson, chairman of the board, Westinghouse, was quoted in the April, 1943 issue of *Western Industry* as saying, "It is inconceivable that you will always produce aluminum out here in the West, ship it east for rolling and then bring it back here to put on airplanes."

The alloying metals used in making magnesium the lightest constructional material are required only in small amounts, and could easily be transported out here without adding materially to the cost of the finished magnesium. Some observers feel that the Western copper producers would have done better to alloy for brass and bronze in the West, instead of shipping the pure copper east. Brass and bronze, however, were Eastern industries long before copper was discovered in the West, so the opportunity to choose a location for fabricating copper was not present as it so obviously is with magnesium, and to a lesser extent with aluminum.

Industrial peace-time uses for magnesium include castings, engine parts, airplane bodies and parts, automobile and truck bodies, and consumer goods such as vacuum cleaners, builders' hardware, optical goods, dishes, etc. In England it was already being used for door handles and other items before the war broke out, and both England and Germany have made their artillery wheels from it in this war. The Germans also are using it for belt buckles and mess kits.



• One of the three refinery buildings. There are also ten chlorination and cell buildings of about the same size, a huge preparation plant and the world's largest redwood cooling tower. In the interest of national security, air views not used.

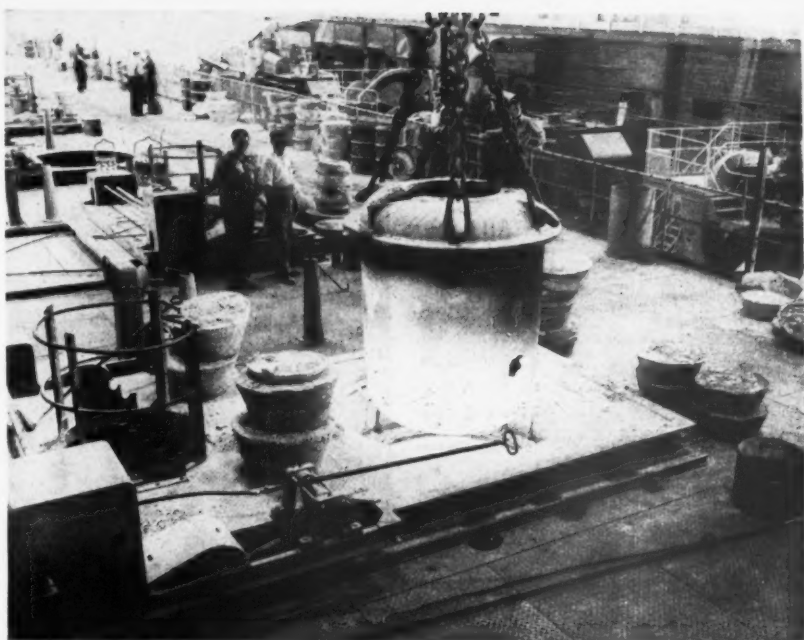


Magnesium resists shock very well, and fabricates well into sheets, tubes, rods, forgings, extrusions and bars. Not only its lighter weight, but also the smaller loss of energy suffered where lighter metals are substituted in reciprocating machinery in the West, and Western mills for tubes, makes it suitable for engines. It can be alloyed with aluminum base metals such as duraluminum and the high-aluminum-magnesium alloys of 4 to 10 per cent magnesium content for high corrosion resistance.

Going back to the question of locating the industry, the fact must be faced that Western producers of magnesium, particularly Basic Magnesium, Incorporated, are a long way from one of their primary industrial markets, namely, the engine manufacturers. Except for a few marine engine builders who do not use light metal except for pistons, the engine industry is all in the East.

Unless automotive and airplane engine factories move west . . . and this possibility should not be entirely ruled out . . . magnesium producers have not much hope of capturing this market, not only because of the long eastward haul of the metal, but also because the scrap coming from extrusions, forgings and the like could not be hauled back economically.

A chemical industry in the West, as important as the magnesium itself, might eventuate. Chlorine, required in large quantities for the production of magnesium by the electro-chemical process, has increased tremendously in use the last few years, and it would be a simple matter to



• Two tons of white-hot magnesium alloy, which has been lifted from the propane gas furnace, being lowered into a cooler. Then it comes out again and is placed in the automatic ingot pouring machine shown in lower picture, to be run into molds.



• Comparative costs of magnesium and other metals per cu. ft. shown above. Comparable weights are: magnesium, 109 lbs.; aluminum, 169; zinc, 447; lead, 687; copper, 555; brass, 535; and bronze, 550 pounds.

increase chlorine facilities to supply other users. Caustic soda, a waste from chlorine made by the electrolytic process, was being poured out onto the desert sands at Basic last July. An oversupply of caustic soda exists in the East, but not in the Western market, which could be further developed.

Electro-chemical plants elsewhere in the country have been able to develop by-products themselves, or to supply materials to others. Examples of chlorine users are the dye-makers dependent on Westvaco, plastic manufacturers on Dow Chemical Company's Michigan factory, and rayon mills on the caustic soda producers. The

largest single user of caustic is the rayon industry, but lack of a convenient supply of cellulose from cotton or wood fibres seems to eliminate rayon as an immediate Western possibility.

Caustic soda also goes into soap and numerous other products, while chlorine is needed in synthetic rubber and in the hydrogenation of vegetable oils for margarine and for hydrogen by-products.

No doubt the magnesium producers are giving careful study to the possibilities but the Western industrial community as a whole has the opportunity and responsibility of giving the situation careful consideration also.

# Safety Last In War Hurry

**Cost-Plus Contracts One  
Of Greatest Contributing  
Causes in Accident Ratio**

**H**IGH accident rates in war plants in the West are due, according to R. E. Donovan, chief safety engineer of the Standard Oil Company of California, to five causes. Speaking before a joint meeting January 14 of the district chapters of the American Foundrymen's Assn. and the American Society for Metals in San Francisco, he listed them as follows:

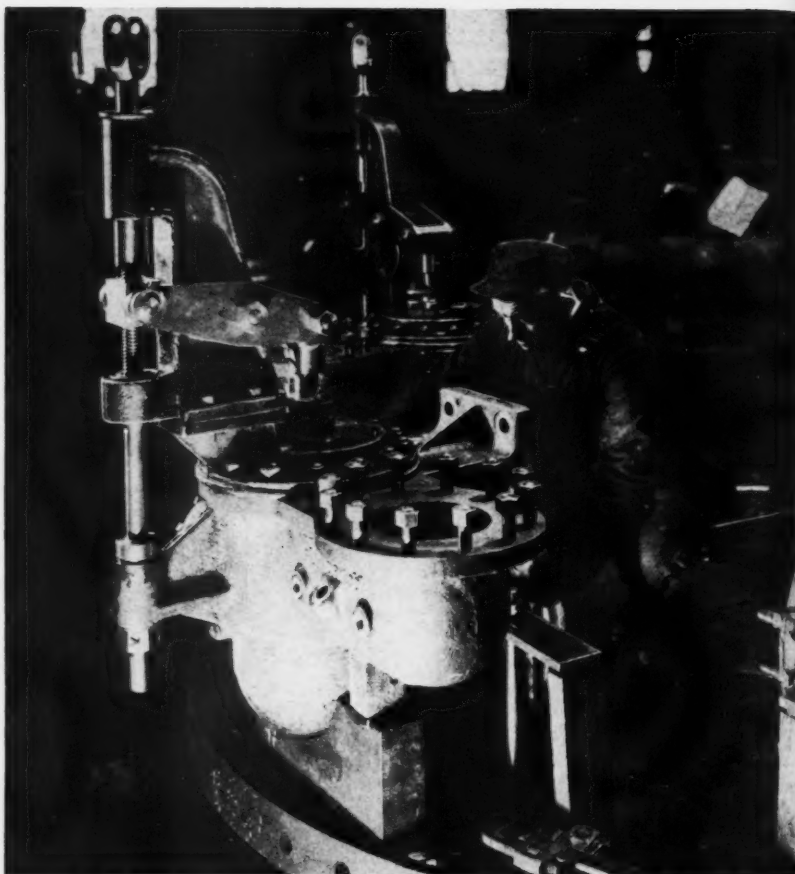
1. Green men.
2. Inexperienced supervisors.
3. Rush—the pushing by the government, the executives and the supervisors, to get the work out quickly.
4. Frame of mind of workers and executives that work must be gotten out regardless.
5. Cost-plus contracts. Previously the cost of insurance resulted in a demand for caution, but the cost-plus contracts have destroyed this.

The number of men killed and injured in production in the United States last year exceeded the losses in military and naval service, Mr. Donovan asserted. Nearly 20,000 men were killed on the job in production, he said, and the loss from injury amounted to 14 million work days.

Responsibility for the effectiveness of safety programs rests with management and supervisors, according to Mr. Donovan. Not only must safety equipment be installed, but the workers must be shown that management and supervisors are interested in seeing it used. Supervisors must carry on the program, which will be a failure if the responsibility is put on the safety engineers. Workers will not be active in safety matters unless it is shown to be to their interest.

Good safety does not slow up production, in his opinion, but on the contrary helps it. In oil well drilling, for example, it was once considered efficiency to "go fast," but this resulted in crooked holes which could only be used half as long.

The great need for safety engineers was stressed at a conference January 19 between Governor Warren and leaders of the California State Federation of Labor, where it was pointed out that swollen war industries had fallen far behind in protective measures. One of the difficulties is the scarcity of good men, due largely to the low pay offered which does not attract high-class men. Another situation demanding attention, it was pointed out, was inadequate medical attention in the case of injuries, resulting from employing physicians in large plants only on a part-time basis.



• Fitting a flange of a steam throttle valve for a Liberty ship engine at the Portland Iron Works, one of the cooperating companies of Oregon War Industries.

## Possibilities For Plastics on Coast

Petroleum is a virtually unlimited source of raw materials in the West for many plastic compounds, according to Dr. G. M. Hebbard of Dow Chemical Company's plant at Torrance, while the timber in the northern Pacific states, salt on the Mojave desert, and ethylene, gas and electricity around Los Angeles provide sufficient materials for the manufacture of ethyl cellulose.

Speaking before the Engineers and Architects Association, he said methyl cellulose can be produced on the Pacific Coast in almost unlimited quantities for numerous commercial applications, and reported that the Dow Chemical Company is looking forward to the time when it can set up plants in either San Francisco or Los Angeles for the manufacture of plastics materials. Styrene from its Torrance plant can be used in many molded products in addition to its use in synthetic rubber.

Among new plastics developments he mentioned were paints superior to the best spar varnish and a plastic much lighter than cork, weighing but  $\frac{3}{4}$  lb. per cubic foot, having unusual insulating properties.

He also hinted of a new development for injection and cast molding which will withstand 800 degrees Fahrenheit without charring.

## Smaller War Plants Contracts

Prime and sub-contracts numbering 2,851 were obtained by the Tenth Region Smaller War Plants Corp. in the last half of 1943. The region includes the three coast states and Idaho, Nevada and Arizona. The amounts involved aggregate \$25,162,121.

Loans of \$4,267,000 were made for 62 plants and \$280,000 of equipment leases were negotiated. The SWPC loans are those which would not otherwise be obtainable under regular banking credit lines.

Of the six months' contracts, 1,880 were prime contracts.

A breakdown of contracts by size of plant for the period shows:

Number Employees	Number Contracts	Amount
Under 50.....	1,650	\$9,026,910
51 to 100.....	608	3,367,009
101 to 250.....	442	8,209,808
251 to 500.....	151	4,273,846

# Building Employee Morale Requires Constant Contact

**T**HERE are three factors, having a direct bearing on morale, common to every organization, large or small, whether a business office, an industrial plant, or a government agency. The first concerns the introduction of the worker to his job, the second proper supervision, and the third the follow-up of the employee after he is put to work.

First, how does the method in which an employee's introduction to his job is carried on affect morale? A few years ago a study was made of workers, showing that 59 per cent had grievances against the company before they ever went to work. They weren't treated as they felt they should have been when they went through the employment office, and by the time they went to work they were already mad at the company about something.

## Proper Introduction to Job

In our organization at Pacific Huts, when we hire a man we take him usually in a group of five or less, show him how to gain admittance to the plant and how to punch his card. We then take him over to a Pacific Hut erected in our yard, and show him the outside of it and try to arouse his interest.

We tell him that the men in our plant are turning out a hut every 10 minutes of the day, fully crated and ready for shipment to Alaska or the Aleutians; that the hut can be erected in five hours by eight soldiers who have never seen one before, that it will hold fifteen men, and other interesting facts which a new employee would like to know. We take him inside the hut and show him how it goes together. We tell him it can be erected in rain or snow, and that the insulation is all self-contained.

Then we look at his hiring slip, find out what his department will be and tell him, "In your department you will be doing thus and so." Then on the way down to his foreman and to the department where he will work we point out to him the other departments so he will know what their relationship is to his department. We point out the cafeteria, the wash rooms, the drinking fountains, and the company store. We introduce the man to his foreman, who turns him over to a leadman who in turn, gives instructions on how to do the job.

Morale must permeate the whole organization. You might give a new employee all this instruction, and then take him to a foreman who would say, "I don't want him; I don't like his looks." We have a foreman with a very rough exterior who

By R. A. SUTERMEISTER\*  
Personnel Director, Pacific Heights, Inc.,  
Seattle, Washington

would give a new man a tough look that would intimidate anyone.

We took a little time to figure out just how to handle that foreman. Now when we take a new man to this foreman we say, "Mr. Jones, this is the toughest foreman in the whole plant." And that usually brings forth a broad friendly smile on the part of the foreman.

If morale doesn't permeate an organization we may get into difficulties with a new man who goes to work beside an old employee. The new man may be quite impressed with the organization and says, "This is going to be a good place to work." The old employee may say, "That's what you think," or "You'll change your tune when you've been here as long as I have." Morale must permeate all departments. One individual who is maladjusted can spoil the whole system.

## Proper Supervision

Secondly, supervision is an important factor affecting morale. The foremen, and the immediate supervisors, are the real personnel men in any organization as they

have the intimate contact with the men eight hours a day. If a man likes his foreman he usually likes the company. It is important then to teach foremen proper principles of supervision based upon an understanding of human relations. It is important to teach foremen to earn the respect of their subordinates and to "command" their respect rather than to demand respect because the foreman is a "big shot."

It is important for the foremen to be sold on the idea of "leading" rather than "driving" their men. Foremen have to be taught how to give an order. "Requesting" or "asking" men to do something is a lot better than "demanding" that they do it in an officious manner. The foreman should also know something about the importance of telling a worker the reason why a job should be done, and done in a particular way.

Orders have to be followed up. If you issue an order and don't follow it up the worker loses respect for you. A foreman has to know something about the importance of consulting the men under him, also. A man who works eight hours a day on a machine, six days a week, knows more about that job than anyone else. Isn't it common sense if a change is considered that the foreman should ask that man about it? Unless you have the workers' cooperation,

• Crating department scene, where plywood wall sections of huts for American troops in distant areas are covered with a box shock "skin," steel strapped and stenciled.



\*Address at Pacific Northwest Personnel Management Association, Portland, Oct. 30, 1943.



the one best way ceases to be the one best way for that job.

The importance of promises should be stressed to foremen. Nothing is more important to the average worker than a promise made by the supervisor. The supervisor may forget it but the worker won't.

The foreman has to be taught the importance of handling grievances in the proper manner. He has to be taught that there is no difference between mythical grievances and real ones. When we think of strikes and the reasons for them,—because there are no toothpicks in the lunchroom, because workers can't get a brighter globe in the washroom—we should be convinced that things unimportant to management may be very important to the workers.

Foremen should be taught something about maintaining discipline. No worker respects a foreman who lets him slip off fifteen minutes early, who lets him loaf on the job or who doesn't maintain discipline. As long as every individual is treated the same, then the workers respect discipline.

Supervision of course is a knotty problem. I think we can look upon improper supervision as a force which tends to beat down the morale of a worker or the enthusiasm which he brings to the job. Most foremen have the chance to practice the tactics of supervision over men, and if a foreman develops that skill he has something which can't be stabilized, can't be drafted, can't be regimented or can't be frozen. He has it after the war is over.

#### Proper Follow-Up

Now, thirdly, the matter of follow-up of the employees. The personnel department must back up the foreman. He has a tough job. He gets the "squeeze play" between management and the worker; he must interpret the employee to the employer and vice versa. The Personnel Department should be there to help get to the bottom of disputes and iron them out.

The department should handle transfers. When an older worker comes in and wants a transfer because he is working with kids and feels that they are not working as they should, the Personnel Department should make an effort to get him transferred, of course consulting the foreman before the transfer is made.

Promotions have an important bearing on morale. If there is anyone within the organization qualified to take the job and someone is brought in from outside instead, what happens to morale? Service records should be reviewed periodically so that no one will be overlooked. In our organization we review records every two or three months, trying to place ourselves in the shoes of the workers and discover any possible causes of dissatisfaction.

When a man comes into the organization we indicate on his employment record what job he would most like to do, so that we can pick up a man's employment rec-

ord and pick out sore spots in the organization where a worker has been placed on job A but would rather be on job B. So it is very important to have a frequent review of a man's service record.

Also, it is important to provide him with services which will obviate the necessity for taking time off from work for various errands and duties.

When a man comes to work for us, we ask him to sign an agreement saying he honestly expects to be on the job eight hours a day, six days a week. We then provide him with services so that he can stay on the job—he can get his driver's license through us, open a bank account by mail, send laundry, buy money orders, make ride-sharing arrangements, obtain gas and shoe coupons, and similar services. It takes two or three clerks to handle this, but it keeps the men on the job and saves the company money.

We have a cafeteria where nourishing meals are served. We have a house organ, called *Hut Stuff*, designed to build up morale in the plant. In this we show pictures of the men at work on their jobs, men who have invented new job methods, men who have sons in the service, and Pacific Huts in Alaska. We try to pat men on the back when they are doing a good job.

The heart of our entire policy as concerns follow-up is keeping an intimate channel of communications open between management and the worker and this, I think, is where many managements fall down. In our organization of considerably under a thousand men we have 15 people in the Personnel Department.

We make a contact every afternoon with all the new men hired that morning. We are interested to know if the work suits them, if it seems too hard for them, if they would rather be on another job and so on.

Once or twice a week I line up with the men in their cafeteria and take my tray to one of their tables just to establish an intimate contact with the workers. I talk to them and let them get things off their chests. At quitting time one member of the Personnel Department stands at the gate in order to make himself available to the workers, for answering questions and settling possible misunderstandings. If the personnel people sit and wait for the worker to come in, the latter is likely to be angry when he does appear because he has waited so long to talk over his problem.

This intimate channel of communication between management and worker is the seeing-eye dog for organization and can prevent dissatisfaction and grievances from arising rather than correcting them after they have arisen.

#### Results for Our Organization

In our organization, what are the results of what we consider to be proper introduction to the job, proper supervision,

and proper follow-up? In the past year we have hired a large number of men. They work fast and we have a very low rate of absenteeism.

The foremen have organized themselves into a club which carries on several worthwhile projects such as serving as "big brothers" to boys who are new in Seattle and on new jobs and have radical adjustments to make.

In one of our departments several months ago a worker agreed to work on Sunday and then failed to appear. This not only threw an extra burden on his fellow workers who did show up, but it prevented some other worker from earning double time for that day's work.

On the following day, unknown to the management, the men in this department held a kangaroo court, appointed a judge and jury. The man who failed to show up for Sunday's work was tried, found guilty, fined \$1.00, and deprived of overtime for a period of a week. Sometimes when a group of men breaks a production record, their foreman takes them out to dinner. Not infrequently they return the following day to set another new record.

#### The Right Spirit

During the summer we had a large number of high school students working for us. On their last day before school reopened, they came to the foreman and asked to be put all on the same assembly line so they could hang up an all-time record. We wondered if the older men wouldn't be a little resentful towards the boys, but five minutes before quitting time the older men came to the foreman and asked if they might not leave their work and help the boys out for the last five minutes of the day.

In summary, may I reaffirm my belief that the vast majority of workers desire to do a good job. Management has the alternative of suppressing this desire or encouraging it. To take no action at all usually results in suppression of the desire because no one in the organization pays much attention to the common worker.

To take positive action in stimulating and encouraging the desire, results in improved morale. This positive action should be the job of the Personnel Department, responsible for considering the human element, and, so far as possible preventing grievances. The three most important ways which the Personnel Department can use in building morale are proper introduction to the job, proper supervision, and proper follow-up. Those should all be directed to make each individual worker feel that he, although but one tiny cog in several thousand, has an important role to play and that his efforts are fully recognized and appreciated by management.

Many employers have learned this lesson the hard way because of the present manpower shortage.





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# Super Duper Die Punch

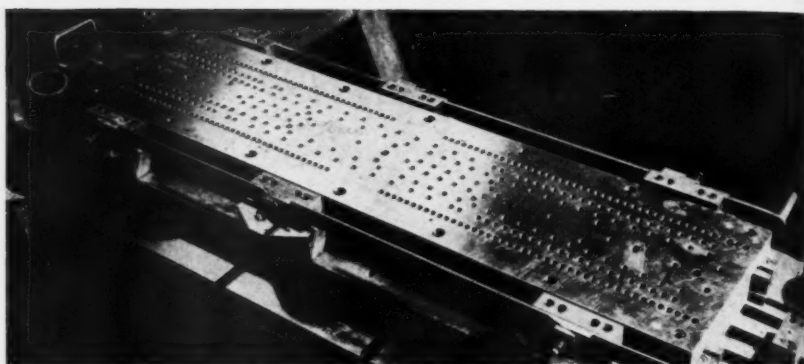
**N**ICKNAMED "The Porcupine" recently developed catwalk piercing die at Boeing incorporates 388 punches with a hole location accuracy of 5/10,000ths of an inch. It pierces a total of 976 riveting holes in the ten separate parts which, when assembled, comprise the walkway through the re-designed bomb bay of the Boeing Flying Fortress.

Production time insofar as the making of riveting holes is concerned, is improved 34.01 times over the old method by the utilizing of the press piercing methods. Because of the extremely close co-ordination of riveting holes, more rapid assembly is made possible, further increasing its overall usefulness.

More important, however, is the diversity of this die, on which two different shaped and sized sheet stock parts are punched, two each of two different angle sections, and four extruded "T" sections. Thicknesses vary from 0.64 to .150, all materials being 24 ST.

Aside from changing plates, which is done with comparative ease and little time, the only changes made in the die during the five different press operations are adjustments to the stock pushers and the indexing points for the various types of material.

A re-design of the catwalk through the bomb bay of the Boeing Flying Fortress made possible the design of the porcupine, and the use of high production methods. The new catwalk includes a primary web or flooring, and a secondary web. .064 dural and .125 alclad respectively, the primary web receiving 388 and the secondary 218 holes respectively. The two reinforcement angles, both on upper and lower sides of the walkway are pierced with fifty-one



• The 388 quills of the "Porcupine" are the most closely coordinated punches used in aircraft work. In the lower picture is shown the intricate hole pattern of the stripper plate. Notice the guide pins located in the punch to facilitate sharpening of the die.

holes each on the same stripper plate. The thickness of these parts is .150.

The second stripper plate is used to facilitate loading the four "T" sections in the die. The forward extruded "T" section receives 40 holes each, while the after two sections get 43. At the point of piercing, these sections are .125.

Stock pushers include four different adjustment operations, one for each different press operation, which aids substantially in making the die sufficiently flexible to handle the variety of parts.

The close coordination of holes called for a high degree of accuracy in die design as well as fabrication. The original design was projected in true perspective scale by production illustration, whereby mistakes in design and other flaws were caught on paper rather than in metal. Construction accuracy was maintained by drilling all critical tooling and punch location holes on a jig borer.

To facilitate ease of maintenance, the punches were mounted in two punch retainer plates. This simplifies the job of grinding the punches as well as replacement, which to date has been extremely low. Similarly, the guide pins were located on the punch rather than the die, to make possible the precision grinding of the die plate without necessitating the removal of the guide pins.

Another problem was the wide variety

of gages specified by the re-design of the walkway. In order to provide the proper punch clearance to minimize the possibility of flaring while punching and at the same time still produce a clean stripping action, the diameter clearance between the punch and the die was compromised, leaning slightly in favor of the heavier gages. With D the punch diameter, and D1 the die diameter, the original problem was endeavoring to balance the two unequal equations:

$$(D + .005 = D1) = (D + .015 = D1)$$

That the final result was a satisfactory compromise is evidenced by the fact that cross sectional photos of rivets driven through the series of holes show no unfilled sections, and that no punches have been broken because of improper stripping. Stripping action is aided by maintaining the punch diameter slightly larger than the shank.

No master gage or template was used in making the die. The base of all hole location is a dimensional layout on which each hole is accurately located in respect of X and Y axis. A portion of the die design, this layout makes possible the reproduction of any part of the die, by drilling all holes on the jig borer, properly positioned in respect to the X and Y axis. Thus costly master tools were eliminated. The inspection of production parts was also simplified by the die.



## FRIDEN . . . High-Speed Automatic Calculators.

offer the solution of the problems in business today, created by the critical shortage of competent clerical help. *Friden Fully-Automatic Calculators* are available when the applications to obtain deliveries have been approved by the War Production Board. Telephone your local Friden Representative to secure information.

*Friden Mechanical and Instructional Service is available in approximately 250 Company controlled Sales Agencies throughout the United States and Canada.*

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## Editor's Field Book Notes...

The Army-Navy War Conference at Los Angeles in January was a sort of "command performance." Industrial labor and political leaders from all over the coast received long telegrams from the Undersecretary of War inviting them to proceed to Los Angeles, and nearly everyone took it as an "or else" proposition. Unfortunately, when they got there it was discovered that the Ambassador Hotel theatre

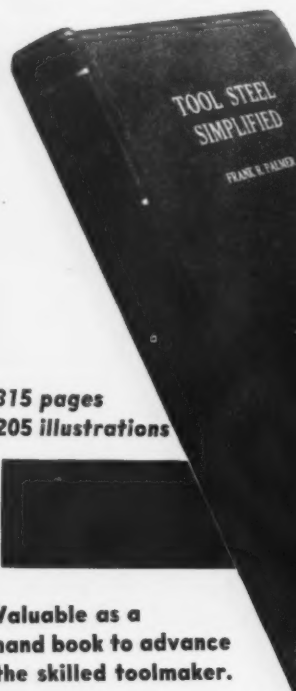
was quite a bit too small to take care of everyone the Army and Navy wanted to come; in fact, more invitations were sent out than there were seats. Consequently some extremely embarrassing cancellation had to be done here and there to shave the list down. Lot of red faces all around. Next time, we predict, the Rose Bowl will be chosen.

Lieutenant-General Knudsen is still at heart an automobile engineer. No more style or military bearing about him than an old shoe, and although he had an interesting story to tell about what he saw in the South Pacific, he was a lot more interested in discussing pounds pressure per cubic

inch on a cylinder head. Take it from him, there are a lot of things going to happen to automobile engines in the future. The aircraft industry isn't the only place where genius will sparkle.

Knudsen is the only public speaker we have seen who carries his own glass of water up to the platform with him. It was a long tall one, and he set it down at the base of his speaker's stand. Every so often he would stop talking, fish around his feet to find the glass, take a good drink and then resume his speech. After a while an orderly had to be sent up to the platform with a pitcher to fill it up for him.

Leave it to the movie industry to do a bit of selling under all circumstances. The guests at the conference were all taken out to the Warner Bros. studios in the evening for a fine buffet supper and two hours of entertainment supplied by the film colony.



## HOW to select and heat treat the proper steel to make any kind of tool

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Carpenter Steel Company

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205 illustrations

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### Bomber Output Record

Consolidated Vultee Aircraft Corporation, which led all other companies in output in 1943, also had the nation's highest output per man per day in the production of heavy bombers in its San Diego division. The average was 8.2 pounds per man day, while the second most efficient company produced 5.8 pounds and the national average of all companies making heavy bombers stood at 4.6 pounds. Consolidated's Vultee Field division at Downey, Calif. was rated by the War Production Board as the most efficient unit in building basic trainers.

### More Ship Trouble

A preliminary hearing before Senator Wallgren at Seattle on alleged defects in Liberty ships, one of which resulted in a ship breaking apart, brought out testimony from Robert P. Day, former U. S. Maritime Commission inspector, that the company had ignored repeated warnings about structural defects. Rep. Magnuson of Washington named 12 ships which allegedly cracked in Alaskan waters. A Truman committee hearing is to be held in Seattle this month.

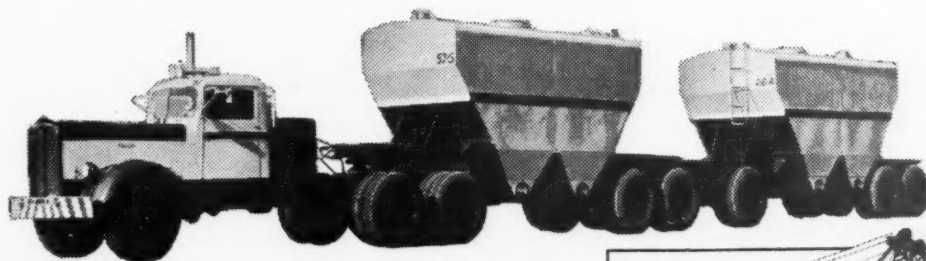
### Predicts Multiple Smaller Diesels

Large post-war expansion of the application of small diesels geared in multiple installations to a single shaft, in place of single higher power engines was predicted by John Dickson, General Motors chief engineer in charge of diesel development, at the Pacific Logging Conference in Seattle.

Such use in tanks and landing boats has increased the trend, he reported, and it will be commercially important because the smaller higher speed engines can be turned out in mass production more cheaply and rapidly to achieve even better flexibility than the single big engine.



# From Gabbs...to Basic...to Berlin ...via **FRUEHAUF TRAILERS**



The production line starts at the Gabbs, Nevada ore mines to produce the magnesium metals for bombs, bullets . . . and the planes to deliver them to Berlin and Tokyo.

From Gabbs, special Fruehauf screw-conveyor, V-bottom Trailers haul the ore 334 miles to Basic Magnesium's Plant. Other Fruehauf Trailers haul the refined metals from there to war plants, where they become magnesium bombs, bullets or parts of fighters and bombers.

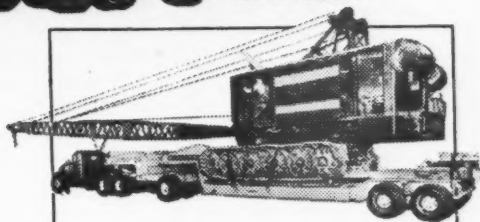
Moving this vital wonder metal in its various stages from ore . . . to ingot . . . to finished metals . . . to assembly lines . . . to the docks, where it's loaded on ships . . . and, even from debarkation ports up to the battle lines . . . these are jobs for Truck-Trailers.

This "production line on wheels" is only one of the many in which Truck-Trailers are doing essential war work that couldn't be done as efficiently and economically, if at all, by other means.

## World's Largest Builders of Truck Trailers **FRUEHAUF TRAILER COMPANY**

Western Manufacturing Plant • Los Angeles

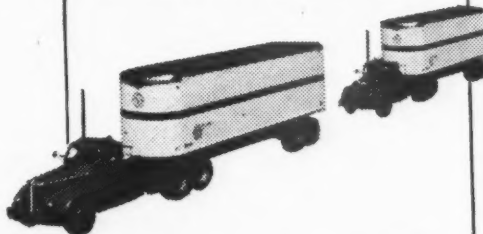
Los Angeles      Sales and Service Branches      San Francisco  
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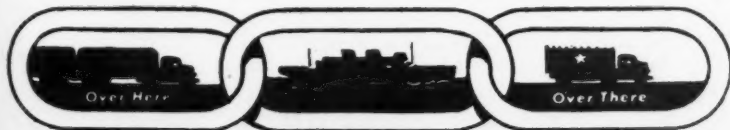
BELYEA TRUCK COMPANY hauled heavy equipment like this big shovel and contract materials for the construction of Basic's plant. This lowbed Fruehauf Carryall Trailer will carry 100 tons.



OSBOURN TRUCKING COMPANY of Los Angeles also hauled much of the special construction equipment and supplies like these huge pipes for the water line to Basic Magnesium.



NEVADA CONSOLIDATED FAST FREIGHT's Fruehauf fleet hauls magnesium ingots 314 miles, from Basic to the Southern California war plants, and returns with general merchandise, fresh meat, fruit, vegetables for war workers and Army camps in Southern Nevada.



TRUCK-TRAILER TRANSPORT IS DOING AN ESSENTIAL JOB FOR ALL AMERICA

# FRUEHAUF TRAILERS

"ENGINEERED TRANSPORTATION"

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## Western Steel Shutdowns Probed

Senator McCarran's committee on decentralization of industry has let no grass grow under its feet in regard to the partial shutting down of big Western war plants, such as Geneva, Fontana, and the north-west aluminum mills. A meeting is to be held at Carson City, Nevada, February 11 and 12, where an attempt will be made to get the general Western sentiment.

Newspapers have been publishing hints of an eastern conspiracy against the development of heavy metal industries in the West, but it appears likely that Senator McCarran's committee will be more concerned with the possible marketing opportunities for the new Western plants and their justification for continued operation.

## Drug Plant Raising

California is the one state in the union suitable for the growing of plants used for the production of drugs, essential oils, antiseptics, condiments, resins, gums, insecticides, and camphors, it was brought out by Monroe C. Kidder of the California Polytechnic School, San Luis Obispo, at a recent meeting of the Conference on the Cultivation of Drug and Associated Economic Plants in California. He estimated California has at present 3,000 acres of such plants under cultivation.

## Pulp Plant to Reopen

St. Regis Paper Company's pulp mill at Tacoma, closed in November, 1942, is to be reopened shortly. It normally employs 700 workers, making kraft material for operations in bags and other containers,

but was shut down for lack of sufficient directly-owned log supply. Recently St. Regis acquired West Fork Logging Co. of Washington, including about 40,000 acres of timber lands, and is estimated to hold altogether some 90,000 acres.

## WESTERN BILLS IN CONGRESS

(Introduced in December)

S. 1567, by Sen. Wheeler. Authorizes Secretary of Interior to sell two quarter sections in Glacier County, Montana, to Brian Connolly at \$4 an acre. Referred to Senate Committee on Indian Affairs.

H.R. 3786, by Rep. Voorhis. Requires registration of foreign contracts and reporting of their terms, whether written or unwritten. Referred to Committee on Judiciary.

S. 1581, by Sen. Thomas. Authorizes Secretary of War to acquire lands and provide facilities to replace Indian fishing grounds submerged or destroyed as result of construction of Bonneville Dam. To Committee on Public Lands and Surveys.

H.R. 3768, by Delegate Dimond. Provides for admission of Alaska as 49th State. To Committee on the Territories.

S. 1571, by Sen. Johnson. To name transmountain Colorado-Big Thompson tunnel "Alva B. Adams tunnel." To Committee on Irrigation and Reclamation.

S. 1580, by Sen. Thomas, Okla. Authorizes Secretary of Interior to dispose of certain lands heretofore required for nonreservation Indian boarding school known as Sherman Institute, Riverside, Cal. To Committee on Indian Affairs.

H.R. 3821, by Rep. Elliott. To authorize construction of Pine Flat-Kings River project, and appropriating initial \$5,000,000. To Committee on Flood Control.

H.R. 3866, by Rep. O'Connor. To reserve certain land on public domain in Utah for addition to Goshute Indian Reservation. To Committee on Indian Affairs.

S.J. Res. 98, by Sen. Davis. To change name of Aleutian Islands to "Billy Mitchell Islands." To Committee on Territories and Insular Affairs.

S. 1597, by Sen. Wallgren. To provide for acquisition of Indian lands for the Grand Coulee Dam and Reservoir, and for other purposes. To Committee on Indian Affairs.

H.R. 3869, by Rep. O'Connor. Duplicate of S. 1597.

H.R. 3865, by Rep. Murdock. To reserve certain public domain lands in Arizona for addition to the Havasupai Indian Reservation, and for other purposes. To Committee on Indian Affairs.

H.R. 3896, by Rep. White. To establish Pacific Standard time for that part of Idaho now on Mountain Standard time during present daylight-saving period. To Committee on Interstate and Foreign Commerce.

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## MAKING PLANS?

Western Gear marine engineers have originated much effective equipment for modern combat and cargo ships. Cranes are but one example. If your problem involves power transmission afloat or ashore, Let us help you work out the answer.

# There's Something New in the Navy!

The submarine tender is one of our most valuable ships. Mother to a deadly brood of long range undersea raiders, the tender carries on its service work under all conditions of sea and weather.

Western Gear Works has designed and built the machinery for a heavy duty crane used for the first time on these tenders. The large picture shows tests being made on one such boat and airplane crane at Moore Drydock Company in Oakland.

The smaller picture shows the mass of machinery required to operate the crane. It looks complicated, yet one of the principal features of this crane is simplicity of control.

Two separate hydraulic-electric winches elevate and lower the boom and operate either the boat or airplane hoisting winches. A large hydraulic, electrically operated speed reducer rotates the crane.

Lifting capacity is 22½ tons at 20 feet per min. hoisting speed.



# WESTERN GEAR WORKS

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## Aluminum Alloys To Compete with Steel

Aluminum alloys developed in the last two years are 48 to 65 per cent stronger than those in use before the war, and it is going to be difficult for steel to displace such a strong, light metal, according to V. N. Kribok, consulting metallurgist for the Lockheed Aircraft Corporation.

He is a member of the War Metallurgical Committee, which is directing the expenditure of a great deal of money by the government for the secret development of light metal products. This knowledge is to be made available to industry after the war. The big problem then will be

production costs in metal, according to Mr. Kribok, to which small attention has been paid in the war effort.

## Fortress Output Speeded

Production of Flying Fortresses by the Boeing Aircraft Company in 1943 was 146 per cent higher than in 1942, and December 1943 production was the highest in the firm's history for a single month, being 92 per cent higher than output in January 1943, and ten times the production during the month preceding Pearl Harbor. Fortresses are being built today in approximately one-third the man hours required at the war's outbreak.

## Boeing Engineer Looks For New Carbide Tools

Radically new designs in machine tools especially built for use with carbides are looked for by W. E. Marshall, carbide tooling engineer of Boeing Aircraft Corp. He told the convention of the American Society of Mechanical Engineers in December that the future use and continued development of carbides is imperative for further progress in metal cutting.

Mr. Marshall considers negative rake milling one of the greatest advances in metal cutting in recent years, and said their experience favored speeds of around 700 to 800 feet per minute, higher feed rates and higher chip loads as giving the most economical tool life. He gave an example of milling SAE 4130 steel with a hardness of 22 Rockwell C at 580 ft. per min. with double negative angles of 10 deg. and a chip load of 0.003 in. per tooth.

Boeing favors a heavy flywheel on the cutter arbor to smooth out the impact blows when cutters of a smaller number of teeth are used. Alloy steel parts are machined dry and the only cooling is an air blast to blow the chips away.

## To Be Exempted From Renegotiation

Canners and food processors are being looked upon with envy in the West by their less fortunate brother industrialists because they are slated to be exempted from renegotiation of war contracts.

The exemption for them in the proposed amendments to the renegotiation act is based on the need for encouraging food production regardless of whether the profits to the processor may be in excess of what is being permitted other lines of business.

Co-operative producers also are excluded in the proposed amendments. Fresh foods and perishables have been excluded from the start.

## Farm Labor Housing

Post-war disposal of war housing units for farm labor housing is under consideration by the agricultural sub-committee of the California Committee on Interstate Cooperation. They have been working with federal housing authorities and with similar committees in the Northwest. California has about 20,000 of these units, mostly in the San Francisco Bay area and San Diego.

## Business Research Bureau

A bureau of business research has been established by the University of Colorado in connection with the university School of Business. The director is Edison R. Cramer, who had been on leave from the university for the last year while serving as regional director of the U. S. Bureau of Labor Statistics. He is a former vice-president of the American Finance Association.



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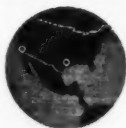
## Best Sellers from Consolidated Steel

Pictured here are current Consolidated Steel Corporation best sellers—vital equipment produced for the armed services and essential industry in the amounts shown. (All figures estimated as of December 31, 1943.)

The diverse character of these products and the precision work involved represent scores of problems overcome, scores of new production techniques adopted. We are, naturally, proud of this array—a record in steel that has won for the men and women of Consolidated Steel every basic government industrial award.

Consolidated craftsmanship, evidenced on this page, will return one day to the engineering and fabrication of *peace-time* best sellers—steelwork that will help to build and maintain America's leadership in the world of tomorrow.

## Consolidated



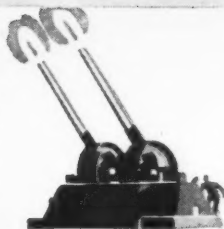
## Steel

FABRICATORS  
ENGINEERS  
CRAFTSMEN

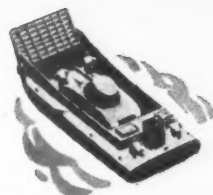
LARGEST INDEPENDENT IN THE WEST



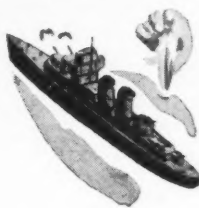
CONSOLIDATED STEEL CORPORATION, LTD., LOS ANGELES,  
LONG BEACH, WILMINGTON, CALIFORNIA; ORANGE, TEXAS



FOR THE NAVY: five-inch anti-aircraft guns. Built to tolerances of 2/10,000 in. Produced in the amount of \$20,000,000.



FOR THE MARINES: mechanized landing craft. Produced in the amount of \$7,500,000.



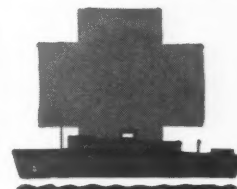
FOR THE NAVY: destroyers, destroyer escorts and frigates. Produced in the amount of \$295,000,000.



FOR THE ARMY: large infantry landing craft. Produced in the amount of \$9,000,000.



FOR THE MARITIME COMMISSION: 12,900-ton high-speed Merchant Marine (C-1) cargo and passenger ships. Produced in the amount of \$175,000,000.



FOR THE NAVY: hospital ships and transports. Produced in the amount of \$17,000,000.



FOR AERONAUTICAL RESEARCH: wind tunnels including the world's highest speed wind tunnel as large as 16 feet throat diameter. Produced in the amount of \$1,300,000.



FOR WAR INDUSTRY: the equipment for fuel, synthetic rubber and other war plants. Produced in the amount of \$4,500,000.

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## Cut Sawdust Plaster Cost

**S**AWDUST plaster has been prepared which gives a finished wall at a cost of 55 cents per sq. yd., as against 50 cents for sand-gypsum plaster, according to report of experiments at the Oregon Forest Products Research Laboratory, Corvallis, by Leo Friedman, Albert I. Ezell and Robert D. Englert.

A previous report told of experiments

which had produced a  $\frac{3}{8}$ -inch thick sawdust plaster bonded with synthetic resins and using non-aqueous solvents, for which costs ranged from \$1.05 to \$1.80 per square yard on finished plaster, and that experiments had been started on a plaster that could be applied as a thin surface coating over a wall base of low grade plywood or boards. This would create a market for low grade plywood and boards to be used as plaster base.

As a result of these experiments the following combination was selected as best from the standpoint of workability, qual-

ities of the finished product and economy:

—80 wood flour	20 parts
Ethocel 100cps	7 parts
Alcohol	50 parts
Paint thinner	35 parts

This differs from the formulation suggested previously in that the amount of resin used has been reduced by 30 per cent of the earlier figure. This represents a saving of 15 per cent in cost of materials in the plaster formulation.

Some tests to determine the effect of water on this type of plaster have been made and the study is being extended to the plastering of large wall sections which will be subjected to extreme changes in humidity in order to study the effect of swelling and shrinking of the wall structure on the plaster.

## Progress and Service!

Two words which have always been foremost in the minds of the men who founded the Pacific Screw Products Corporation, making it possible to build this progressing enterprise from a two-man business back in 1929 to where there are now over 500 people regularly employed.

While progress has been continuous over the years, service rendered has been the predominating factor responsible for the confidence demonstrated by our thousands of satisfied customers in continuing to place their repeat orders with us!

It is true that the men and women of Pacific, and vast numbers of specialized Automatic Machines are now engaged in vital government War Work, but Pacific has never lost sight of the fact that the individual and his wants must be taken into consideration at all times. Pacific boasts of its fine record of having kept faith with all its pre-war customers by continuing to handle all their orders on Precision Screw Machine products.

With the many new type Automatic Machines added for War Work, post-war requirements will be more adequately met, and quicker deliveries will be the result.

We can now serve you on any order from 1/32 to 6 inch capacity through the spindle.

## Pacific Screw Products Corp.

Established 1929

*Largest and Best Equipped Screw Machine Plant in the West  
Latest Type Automatic Screw Machines,  
Grinders, Milling Machines*

5211 Southern Ave. South Gate, Calif. Kimball 5211

### Education Needed On Uses of Wood

In a nation-wide survey of the new opportunities the post-war world holds for the lumber industry, Dell Pound, Los Angeles industrial counselor, found that unfamiliarity with wood possibilities was a major obstacle that would have to be overcome.

He observed that educational institutions as a rule have founded their structural texts upon steel, and when young engineers are graduated from such institutions, they are not qualified to deal with the problems of timber engineering. Therefore, they design in other mediums.

Only ten universities were found offering courses in timber design, and in only two instances were these universities conversant with the newer developments.

He also found that the actual research toward better usage of timber is not carried out by the timber industry either as individual concerns, or as groups, in a manner conducive to actual commercial development on a large scale, whereas the steel industry has done so. The masonry men have concentrated upon merchandising, politically, as well as otherwise, to the end that in some communities only masonry dwellings are allowed.

In many localities where engineers were interviewed, Mr. Pound found a sad lack of knowledge concerning timber and its uses, the engineers being ignorant of even where to procure data which is already published concerning the characteristics of timber.

### Shipyards Lead

Washington shipyards provided 71 per cent as many man hours of work in 1943 as the state's six basic industries in 1940. The year's total is estimated by the State Department of Labor and Industries as more than 216,500,000 man hours, exclusive of the Bremerton Navy Yard's greatly expanded wartime activity.

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**SKILDRILLS—Light, com-  
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It's the *punch* and *power* of SKILSAW TOOLS that makes them favorites in War Plants today. It's the *punch* and *power* of SKILSAW TOOLS that will make them favorites with you! SKILSAW TOOLS are rugged, dependable, *faster-working* . . . they'll bust tough bottlenecks, boost production and stand up longer under hardest usage. And SKILSAW TOOLS are light, compact, perfectly balanced . . . they'll handle easier, do more jobs and do them better.

Want to see for yourself how SKILSAW TOOLS can save money, minutes and manpower in your own plant? Ask your distributor for a demonstration of SKILSAW TOOLS today!

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**Emulsion Technology, Theoretical and Applied.** This book includes symposium on technical aspects of emulsions, and is helpful to the beginner as well as the specialist. It covers the theory and application of emulsions and emulsifiers in agriculture, road-making, food, rubber, leather, wool, paint and the varnish industries, etc. Much valuable data concerning the equipment used in technical emulsions are included as well as an extensive bibliography, also list of emulsifying agents and many formulae of commercially used emulsions. Chemists and industrialists desiring to improve present products or create new ones will find this book helpful. Price \$5.00. *Chemical*

*Publishing Company, Inc., 26 Court St., Brooklyn 2, New York.*

**Teacher's Manual for Military, Marine, Vocational and Industrial Training,** by Lt. Commander Nicholas Moseley. Book of progressive teaching practices that have been developed in past decades, giving lessons that have come out of training hundreds of thousands of workers and soldiers for the war effort. This manual is a working guide to the common meeting place for knowing and teaching. Price \$2.00. *Cornell Maritime Press, 241 West 23d Street, New York, N. Y.*

**How to Train Workers Quickly,** by Glenn Gardiner. A manual for training men and women in wartime. The booklet is divided into three sections: How to instruct. Training Women. Appendix, which contains series of practical "self-test" questions by which a foreman can check his knowledge of job instruction. Price 45c. *Elliott Service Company, 219 E. 44th St., New York 17, N. Y.*

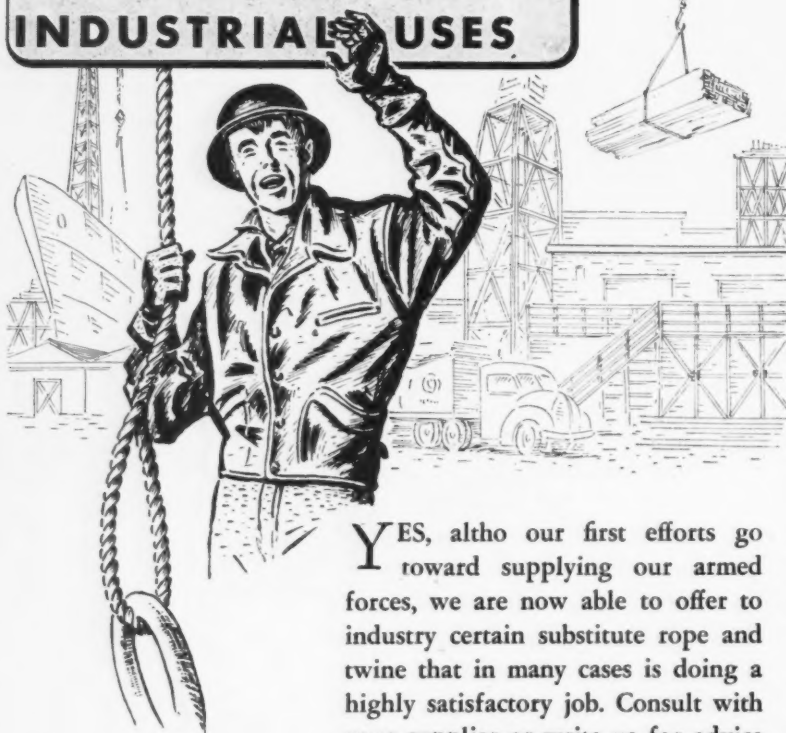
**Manual for On-the-Job Instruction of Screw Machine Personnel.** A 107-page book presenting easily understood instructional material covering all types of multiple spindle automatics. Extensive data on grinding and setting tools and comprehensive trouble charts are included. Price \$2.00. *National Screw Machine Products Association, 13210 Shaker Square, Cleveland 20, Ohio.*

**Maintenance Arc Welding.** Comprising 25 of the most significant award papers on maintenance arc welding. The information contained in this new volume is particularly useful in keeping machinery and plants in operation despite critical shortages in materials and equipment. Price 50c. *The James F. Lincoln Arc Welding Foundation, P.O. Box 5728, Cleveland, Ohio.*

**Pyrotechnics Civil and Military,** by G. W. Weingart. This book gives complete record of the development of the art of pyrotechny up to the present time. The formulas are all taken from those in actual use and will produce effects for which they are indicated. Machines and tools shown are those used in commercial manufacture. The article on Chinese firecrackers is said to be the first authoritative detailed description of this subject written in the English language. Price \$5.00. *Chemical Publishing Company, Inc., 26 Court St., Brooklyn 2, New York.*

**Where's the Money Coming From?** by Stuart Chase. The author's answer to the Number One worry of Americans who are trying to look realistically into the future. This 179-page book gives a simple explanation of the true nature of money, the realities behind the debt structure, and the means that exist for controlling our economic future. Price \$1.00. *The Twentieth Century Fund, 330 West 42nd St., New York, N. Y.*

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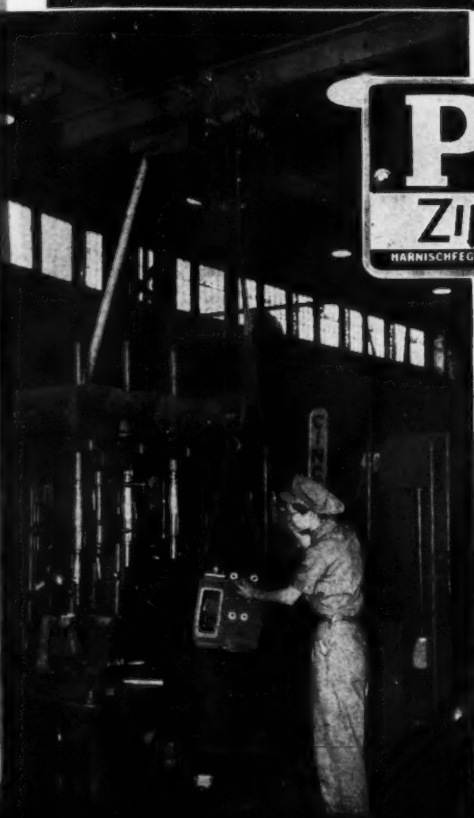
Right you are, Miss War Winner! And give your boss credit for knowing a thing or two. He knows that war production calls for speed — that electrical energy is faster, costs less than human energy. He knows how much time it saves you — how much effort and fatigue you're spared.

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# Steel and Aluminum Lids To Be Pried Up

**W**ASHINGTON, D. C.—The insistence and courage of Senators Hayden of Arizona and McCarran of Nevada in getting favorable action on the establishment of a joint House and Senate committee to investigate the centralization of prime industries of the United States is a fine example of what may be accomplished by competent leadership and teamwork.



This is regarded by the whole delegation from the West Slope as a model for future action in connection with the many problems that will arise as the result of the inevitably conflicting interests of the industrial East and the budding industries of the West. It would amaze you out there to feel how this success has raised the hopes and galvanized the spirits of the whole group in Congress from the West Slope.

It still remains, however, for a similar *esprit de corps* to be developed among

By ARNOLD KRUCKMAN

those here who represent the important commercial, industrial and civic organizations of the Far West. This situation does not help the Western members of Congress in their budding approach to team play. They are frank, privately, in commenting on this lack of unified cooperation. But they do not blame the individuals who represent Western organizations in Washington. The isolation of spirit obviously stems from the localities and the organizations they represent. These competent representatives here, of chambers of commerce and other organizations, properly do what they are told.

The solvent, we think here, must be found out there. You will need sectional unity of purpose and plan in the complicated and chaotic days ahead. And it will serve no good purpose to be afraid of the charge of sectionalism or to fear your unity may be classified as pressure. This country is now so vast and so complicated that

only those groups which work in open and legitimate unity can present their proper aspirations adequately.

You will swiftly have a demonstration of the worth of the McCarran Committee in the hearing at Carson City, Nevada, early in February, when the reasons for the WPB halting completion of the Geneva steel mill will be gone into. It will be held by a joint subcommittee representing both the Senate and the House, consisting of three members from each branch of Congress, and headed by Senator McCarran and Congressman Cecil King of Los Angeles. The others from the House are John M. Coffee from Washington and Francis Case from South Dakota. Represented also will be the Western Council of the Conference of State Governments.

The hearing is the opening gun in the effort to stop undue curtailment of western industries. Its importance obviously cannot be overemphasized. The character and tempo of this hearing will have a profound effect upon the agencies in Washington, because, when a Congressional committee goes afield, holds hearings, and prompts the taxpayers to tell their troubles in the open, the Administrative people are on the defensive and become acutely nervous.

In effect, the Congressional committee is turning over the stone to inspect what is crawling around underneath. How this is

(Continued on Page 48)



## WOULD YOU HAVE THE NERVE?

How'd you like to "sweat it out" with the Paratroopers? . . . step off into space on a combat mission? \* Perhaps you, and we, could do it *if we had to*. But all that Uncle Sam asks of *us* is to buy more War Bonds, sacrifice a few comforts and produce for Victory! \* The PAYNE plant has concentrated on war production for two years. But PAYNE Gas Furnaces will be back . . . surpassing even their pre-war standards of design, quality and performance. *You can count on that.*



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600,000 miles . . . the equivalent of 25 trips around the world . . . that's the distance this chain has traveled with no "time out" for repairs. It's been operating for almost 7 years, yet not one link has been removed . . . "stretching" has been less than nominal.

THE "success" story of this sextuple roller chain Generator drive is typical of Baldwin Roller chain belts. The drive was designed for 150 H.P. but has delivered up to 200 and has been in constant operation since its installation. And outside of periodic lubrication, the drive has required no attention throughout this operating period.

The positive grip of Baldwin Roller chain belts . . . their ability to absorb shock loads . . . the low maintenance

and quiet operation that proved so valuable here can help you. For Baldwin Roller chain belts give you these advantages:

1. Long, trouble-free service
2. High shock-absorbing ability
3. Easy, simple installation
4. No deterioration from oil and grease
5. No power loss—with or without adjustment

For complete information on Baldwin Roller chain belts and how they can help you cut power transmission costs, call your Baldwin Man or write for your copy of Catalog M. Baldwin-Duckworth Division of Chain Belt Company, 352 Plainfield Street, Springfield 2, Mass.



# BALDWIN

## ROLLER CHAIN BELTS

**KRUCKMAN** (Cont'd from Page 46)

done, and the sincerity with which the locality or the region cooperates in the undertaking, sets the effectiveness of the investigation.

You get a good illustration of the principle here discussed by following what happens in connection with the recently created WPB Steel Advisory Committee, which, it is reasonable to assume, will have a more important influence on the future of the industry than may be superficially apparent in its relations with WPB. Congressman King and other members of the McCarran Committee asked Donald Nelson to place Mr. Kaiser or some comparable

representative of the industry from the West on the committee.

Nelson fairly represents the attitude of the administrative agencies to Congress—promptly submissive to the Executive, but condescending to the members of Congress. He told the McCarran Committee members that the Steel Advisory Committee was very, very nicely balanced as it has been constituted, and he hoped they would see that it would be a pity to upset this balance. He suggested that the West already was adequately represented by those men appointed from the East for U. S. Steel and Republic Steel.

It was very clear that Nelson would not

upset the very, very nicely balanced advisory committee, so it has been decided that the McCarran Committee also will inquire into Nelson's reluctance to upset the very, very nice balance of the committee when the McCarran Committee holds its hearing in the West.

This again is an exploration that may reveal all kinds of extremely astonishing things. The hearing also is apt to touch upon the American Iron and Steel plant projected for establishment in Washington in 1942. It has been pending ever since. Incidentally, if you have any suggestions about industrial snarls or conditions that might bear investigation, communicate with Senator McCarran—Pat McCarran—or Representative Cecil R. King. You simply address them at the Capitol, Capitol Hill, Washington, D. C.

#### Investigate Aluminum

It is likely the McCarran Committee also will make some inquiry about the aluminum freeze. Upwards of 20 more plants are to be closed in February to effect a 40 per cent reduction in production. It is not clear how many plants are scheduled to be shut down in the West, but apparently the list will include all plants in California and approximately 10 plants in the Pacific Northwest. The list is said to embrace the Alcoa plants at Los Angeles and Vancouver, the Defense Plant Corporation plants at Troutdale, Riverbank, Spokane, Longview, Tacoma, and the rolling mill at Trentwood.

WPB has an agreement with members of the Western Congressional group it will not proceed to final closing until Phil Wilson, now heading the Aluminum and Magnesium unit, has another conference with the Westerners. It will be reassuring to learn that WPB has given a pledge the program will NOT interfere with the development of the kaolin clay alumina plant at Salem, Oregon.

Apparently it was only by a fluke that the West escaped an order that would already at this time have placed its aluminum plants under a Directive to close. The order which closed the Eastern plants came out immediately after Congress adjourned for the holidays, and the Western delegation is quite convinced the brass hats in WPB expected they would all hasten home. But they were still in Washington when the Eastern plants were ordered closed, and they promptly made an appointment to explore the Western situation, meeting with A. H. Bunker, formerly head of the Aluminum and Magnesium Division and now in charge of all critical metals, and with Phil Wilson, who has succeeded Bunker.

#### Canada In the Picture

It was a lively meeting. The Westerners were told the problem involved WMC and ODT as well as WPB. The WPB men argued that their hands were tied by lack of manpower and by shortage of transport facilities. The Westerners candidly



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2. *Are all Pioneer Belts made of Synalite?* No, you have your choice of Synalite or compounds of ordinary government synthetics. Synalite, however, is unsurpassed for all services.
3. *Price?* Synalite construction carries a premium compared to belts made from ordinary synthetic rubber. It is costlier to compound and produce. But performance more than offsets higher first cost.

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brushed aside the manpower argument as hokey and suggested that the substitution of aluminum products from Shipsaw in Eastern Canada did not, in their minds, provide any solution to the transportation troubles.

It developed that the aluminum made in Eastern Canada is produced from bauxite brought from British and Dutch Guiana and from Brazil, a long ocean haul in scarce bottoms; while the aluminum made in Shipsaw is transported West at least 2,500 miles over crowded rail lines to the Pacific Coast. Aluminum manufactured on the West Coast on the other hand, is produced from bauxite brought from Arkansas, and is distributed directly from ports immediately adjacent to the plants.

Apparently even the WPB people did not feel the transport problem was a strong argument for they fell back upon our irrevocable commitments to the Canadians. The plant, built by Defense Plant Corporation financing, has an annual capacity of 1,100,000,000 pounds. Total capacity of all 60 plants in the United States is 2,200,000,000 pounds.

It appears we are irrevocably committed to take 600,000,000 pounds of aluminum from the Shipsaw plant. If we cancel the contract with the Canadian Alcoa people, in order to keep our own plants going, we must pay the Canadians a penalty of 5 cents per pound, or a total of \$30,000,000.

The WPB people apparently did not agree with the Congressional delegation that it might be sound business to take the loss and keep the home fires burning. Nor did they agree with Secretary Ickes that it is better business to use the vast and cheaper power resources of the West rather than use the scarce and costlier coal and oil fuel.

It appears we require approximately 2,835,000,000 pounds aluminum. We make 2,216,000,000 pounds prime material, 516,000,000 secondary material, and we import—from Shipsaw—636,000,000 pounds aluminum. This gives us a total of 3,368,000,000 pounds against requirements of 2,835,000,000 pounds, a surplus of 533,000,000 pounds. And of course we have a stockpile of sizable proportions.

#### What We Pay Them

We pay the Canadians on the escalator basis. They get 15 cents per pound for 80 per cent of their product, and for the rest they get a gradual increase, reaching a maximum of 21 cents per pound. The average is probably around 17 cents per pound for all we buy. It is striking that the total capacity of the plants in the Pacific Northwest is estimated at 632,000,000 pounds, approximately the total we are committed to take from the Canadian Alcoa unless we default.

The Northwestern plants, like all other American plants, receive 15 cents per pound. But the Northwestern plants, using over 75 per cent of the power produced at

Bonneville, and other waterpower energy, are credited with making aluminum at a cost from \$20 to \$40 less than it can be made anywhere else.

There are no figures available to show what it costs to bring a ton of aluminum from Shipsaw, but the distance is not dissimilar from the haul from Mobile, Alabama. It costs \$8 per ton to bring alumina, the intermediate stage, from Mobile, 2,200 miles. The aluminum then is sometimes shipped back East for fabrication—costing freight again—and it is often finally shipped back again in sheets and forgings to California and the Pacific Northwest.

The Western delegation naturally wants to know, and since we have the facilities either wholly complete or so nearly ready that they may be completed almost overnight, why so much waste might not be eliminated, and why the most low-cost production facilities in the United States should not be given preference over those which cost considerably more in Canada, even if the Government must default and pay for the default? It is extremely probable the McCarran Committee, if only slightly encouraged, may ask questions that may be just as embarrassing as the questions many Congressmen and others are asking about the Canol business.

## Ingenious New Technical Methods

Presented in the hope that they will prove interesting and useful to you.

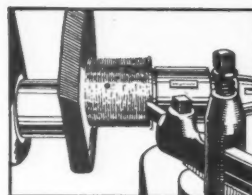
### New Metal Surfaces Made by Spraying

Molten metal is now sprayed or atomized on to metal surfaces for the purpose of salvaging worn bearings, shafts, cylinder walls and such parts. Metallizing, as the process is called, is also used for putting a non-corrosive coating on iron or steel surfaces subject to corrosion such as cylinder walls of internal combustion engines, valve gates and such parts in contact with water. The metals to be sprayed may be aluminum, zinc, stainless steel, high carbon steel or other alloys depending upon the character of the surface desired. The sprayed surface may be "over built" and machined down to size to obtain accurate surfaces.

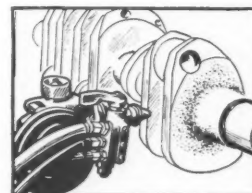
Metal spraying guns have been perfected for use with various types of gases for heat, depending upon the melting temperature of the metal to be sprayed.

We hope this has proved interesting and useful to you, just as Wrigley's Spearmint Gum is proving useful to millions of people working everywhere for Victory.

You can get complete information from  
The Metallizing Company of America,  
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Rough threading—cooling locks metal firmly to surface, producing a permanently tight bond.



Sprayed journal before finishing—Main bearing journal after surface has been Metallized.

Y-101

# WESTERNERS AT WORK...

## Arizona

William A. Sullivan has succeeded Robert Kendall, who resigned to become War Manpower Commission director for Arizona, as a member of Arizona Employment Security Commission.

## California

Glenn A. Bowers, La Jolla, formerly with Consolidated Vultee Aircraft Corp., has been appointed director of industrial relations, Food Machinery Corp., to be in

charge of industrial relations of Anderson-Barngrover and Bean-Cutler divisions of Food Machinery in San Jose. . . . Albert W. Wohlrab has been appointed manager of customer engineering for all branches of International Business Machines Corp., San Francisco.

Martin Wagner, San Francisco regional director, National Labor Relations Board, has been transferred to Cincinnati. Joseph E. Watson, Kansas City regional director

has been moved to the vacancy at San Francisco.

Following changes in management personnel, Pacific Gas & Electric Company: Thomas J. Straub, general counsel; R. H. Gerdes, assistant general counsel; W. B. Bosley, special counsel; W. G. B. Euler, vice president in charge of operations; I. C. Steele, chief engineer; and Walter Dreyer, chief of division of civil engineering.

Geo. B. Herrington has been appointed Transport Personnel Field Representative for the Office of Defense Transportation stationed in regional War Manpower Commission offices in San Francisco. . . . Sam Kagel has been appointed to succeed James P. Blaisdell as Northern California director of the War Manpower Commission.

Charles P. Bayer has been appointed assistant to president and Harold W. Wright, secretary, Los Angeles Chamber of Commerce. . . . James D. Crain, manager, Ridge Foundry, San Leandro, has been appointed to membership committee, Gray Iron Founders' Society, of which he is a director.

W. A. Thompson Jr. has been appointed manager of petroleum and chemical division, Barrett & Hilp, San Francisco. . . . Albert J. Thille, Santa Paula, has been elected president of Calavo Growers of California. . . . Roy E. Larson has been promoted to assistant treasurer, Western Pacific Railroad Company.

## Colorado

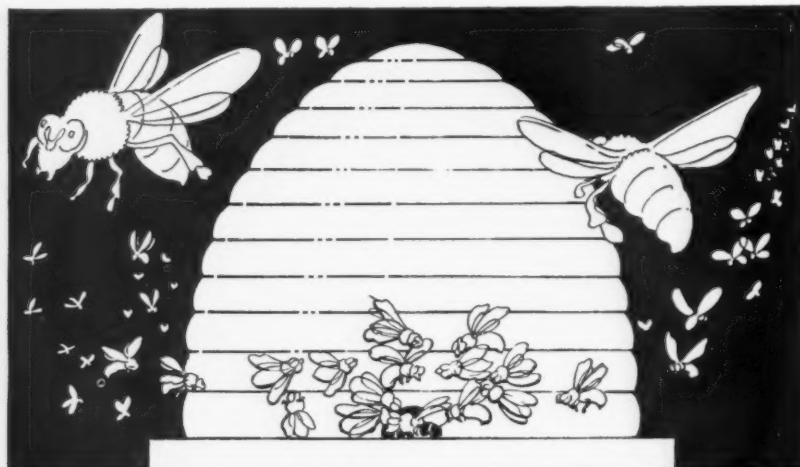
W. H. Bachman has been elected president and general manager of the C. S. Card Iron Works Company, Denver, succeeding C. S. Card who was made chairman of the board. . . . W. C. Sweinhart, Denver, has been elected president, National Association of Commissioners, Directors and Secretaries of Agriculture.

## Idaho

Charles V. Wayland, Boise, has been appointed to the staff of the state planning board and the department of public works. . . . W. L. Leshar has resigned as district state highway engineer at Shoshone to become city engineer at Burley. Leshar will be succeeded at Shoshone by Henry B. Sternberg, senior highway engineer at Pocatello.

## Montana

Clayton S. Crocker, supervisor of the Nezperce National Forest, Idaho, has been appointed chief of the division of fire control of the northern region of the Forest Service, Missoula, replacing Axel G. Lind who takes charge of the Division of timber management as successor to Elers Kodak retired.



## STAUFFER Chemical plants are busy "bee hives"

We're busy as bees. Old plants have been enlarged and new plants have been built. All are working overtime to provide quality chemicals in ever increasing quantities. As promptly as is humanly possible we are making deliveries to the industries of the West in the all-out effort to speed VICTORY. Even though busy, we will gladly discuss your chemical problems with you, and with a background of 50 years experience, endeavor to help you solve them—please call upon us if we can be of service.

LOS ANGELES



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# STAUFFER CHEMICAL CO.

## Nevada

Daniel H. Heaton, Reno, has been appointed executive secretary of the general salvage division of War Production Board for Nevada territory, replacing Bernard C. Hartung who has been appointed field representative for the general salvage division of WPB for the eleven Western states. . . . George C. Schweis, Reno, has been elected first vice president, National Association of Commissioners, Directors and Secretaries of Agriculture.

## New Mexico

Fred Healy, assistant state highway engineer, has been named acting state highway engineer, succeeding Frank M. Limbaugh, Albuquerque, resigned.

## Oregon

Walter W. R. May, editor, Oregon City Enterprise, has been appointed information executive on part-time consultant basis and James A. Mount, head of information division, Portland district office of OPA. . . . Harold J. Nickerson, North Bend, has been named secretary of the Umpqua Valley Chamber of Commerce, succeeding Harry Pinniger who has been named chairman of committee appointed by Governor Snell to investigate Oregon's milk industry situation. . . . Bruce A. Rogers, senior metallurgist of Bureau of Mines, has been appointed supervising engineer for the Northwest Electrodevelopment Laboratory at Albany.

## Utah

N. L. Wimpler, mining engineer and George M. Potter, metallurgical engineer, have been transferred from the Salt Lake City headquarters of the Bureau of Mines, to Pullman, Washington, to establish a consulting office.

## Washington

J. A. McEvoy, sales manager, Bloedel Donovan Lumber Mills, Seattle, has been appointed member of the National Industry Advisory Committee, OPA. . . . E. J. Hayes, Seattle, has been appointed Pacific Northwest regional aide to A. B. Hansen, chief of new pulp-production section of WPB. . . . Nils M. Anderson, Tacoma, has been appointed vice president of recently formed Marathon Paper Mills of Canada, Ltd., Toronto.

## Associations Elect

National Aircraft Standards Committee of prime airframe contractors to the United States Government elected the following Westerners as officers for 1943-44: National chairman, Jack F. Cox (Vega, Burbank, Calif.); Western chairman, Charles Sardou Jr. (Consolidated-Vultee, Downey, Calif.); Western vice chairman, Glen Aron (Northrop, Hawthorne, Calif.); Edward W. Wells, chief engineer, Boeing, Seattle, is a board member.



Yes, as a worker in American Industry, *you* control the course and duration of the war. Man or woman, executive or laborer — whether your product is for military or civilian use — you are a vital unit in American Production, the force that is conquering the enemy on all fronts.

## Be a CITIZEN SOLDIER on the Job

Victory is a personal responsibility of yours, of ours—and of every American. The more industriously and skillfully we work, the sooner the war will end.

Conservation and maintenance of essential machines by proper use, constant care and correct lubrication, is an obligation we all owe to our fighting forces. Your Associated representative — whose up-to-the-minute knowledge of wartime changes and developments in fuels and lubricants is at your disposal—will gladly help you with any lubrication problem.



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TIDE WATER ASSOCIATED OIL COMPANY



# THE WESTERN OUTLOOK...NEWS...STATISTICS...

## THE PICTURE

On the up side: Larger December deliveries of ships and planes, unceasing demand for lumber, Pacific Northwest carloadings for December sharply up. On the down side: Slight decrease in employment totals, both in general employment and manufacturing, slight decline in electric power usage, surpluses of steel (except plates), aluminum, copper and other metals, government shutting down ore stockpiles.

Cancellations of concrete barge contracts because enough self-propelled vessels available, probably wooden barge construction will get the same treatment, but landing craft work steadily increasing, and aircraft output quota for 1944 upped 25 per cent.

## Lumber—War Items Only

The offensive phase of the war has brought insatiable demands for expendable items like boxes and cases for supplies going overseas, military truck bodies, pontoon bridges and the rough and ready requirements at forward bases, the West Coast Lumbermen's Association reports. Every fresh point of attack by the American forces means that still more lumber is needed for these offensive requirements; and the vast plans of attack in Europe during the present year are foreshadowed in the current demands upon West Coast sawmills, with the War Production Board controls continually becoming more drastic. There is yet no prospect that more West Coast lumber can be made available in 1944, for civilian home and farm building, beyond the urgent defense housing which must be completed as an essential part of the war itself. As at the beginning of 1943, the West Coast mills are still vastly oversold, in their efforts to supply war requirements. There are over one

billion feet of unfilled orders on the mill boards, while the aggregate of sawmill stocks has been reduced a further 20 per cent.

Cumulative figures for 52 weeks in thousand board feet are as follows:

	1941	1942	1943
Production	8,614,814	8,507,537	7,920,421
Orders (net)	8,800,819	10,031,421	8,396,277
Shipments	8,614,149	9,245,994	8,157,702

## Aircraft—Heavier Planes

Output of the aircraft plants on the Pacific Coast for December was 560,000 lbs. higher than in Dec. '42, although 54 less planes in number were produced. The total number built was 2,527, and the weight 30,880,000 lbs. For the entire year, 26,636 warplanes were built, against 17,694 in 1942, a gain of 50.54 per cent in number, but the total weight of 282,960,000 lbs., a 72.31 per cent gain, indicates the shift to heavier planes. The seven members of the Aircraft War Production Council have set 225,000 tons as their minimum quota for 1944.

## Employment—Seasonal Slacking Off as Fruit Packing Ends

Estimated Number of Employees in Non-Agricultural Establishments—In Thousands—Source: U. S. Bureau of Labor Statistics

	—Montana—		—Idaho—		—Wyoming—		—Colorado—		—New Mex.—		—Arizona—		—Utah—		—Nevada—		Total Mountain	
	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943
January	113	110	88.9	105.0	54.0	57.0	249	288	73.6	80.3	99.5	111.7	131	182	36.0	43.8	845	978
February	112	110	89.4	106.3	53.5	57.8	251	278	74.9	79.5	99.4	112.6	131	174	35.9	45.0	847	965
March	112	110	90.2	101.9	54.2	58.6	256	281	81.3	78.6	100.3	112.2	139	173	37.1	48.3	870	964
April	113	110	92.5	104.3	55.2	59.0	260	282	87.0	78.9	111.1	114.1	146	171	37.7	47.1	903	968
May	116	111	95.5	106.6	58.1	60.5	269	280	94.1	78.3	110.3	118.9	155	173	39.0	47.4	927	970
June	114	112	94.1	101.3	59.3	61.4	276	285	79.2	79.1	110.2	116.2	164	173	37.4	47.3	934	974
July	114	112	97.0	100.4	61.2	61.0	300	284	81.5	81.8	106.1	112.4	165	180	37.8	44.8	963	978
August	119	113	118.7	98.4	63.7	61.9	308	287	87.8	83.2	113.1	108.7	180	178	39.5	41.9	1,030	971
September	118	115	124.0	102.0	60.5	62.1	318	290	84.7	80.7	113.0	107.6	193	175	43.9	44.0	1,061	978
October	118	114	124.3	101.4	65.9	62.1	310	288	82.5	79.8	112.4	109.2	187	172	42.7	42.1	1,043	960

## MANUFACTURING

	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943
January	15.0	15.1	11.6	11.8	4.0	3.7	46.7	66.5	4.8	4.4	8.4	12.7	20.7	30.8	1.5	1.7	113	147
February	14.7	14.5	11.8	11.9	4.0	3.7	49.5	64.2	4.9	4.5	8.7	12.8	20.9	30.6	1.5	2.0	116	144
March	14.6	14.3	11.8	11.8	3.9	3.7	52.1	63.4	5.0	4.5	9.2	12.6	23.8	30.5	1.5	4.2	122	145
April	14.7	14.2	12.3	12.2	4.0	3.7	54.7	63.9	4.7	4.4	10.2	12.5	27.3	31.2	1.6	4.5	130	147
May	14.9	14.2	13.5	13.4	4.2	3.7	56.1	64.0	4.6	4.2	10.1	13.8	29.9	30.6	1.5	4.0	135	149
June	15.1	14.4	14.7	14.0	4.3	3.8	58.7	65.0	4.4	4.5	10.3	13.1	32.2	33.7	1.5	5.5	141	154
July	15.3	14.5	16.5	15.2	4.4	3.9	61.6	67.0	4.3	4.7	10.2	13.5	38.6	40.4	1.6	5.2	154	164
August	16.1	15.2	...	14.2	4.8	3.9	62.3	67.0	4.6	4.6	10.4	13.4	37.2	36.9	1.6	5.0	153	160
September	15.7	15.2	18.2	15.8	4.8	3.9	60.3	68.5	4.6	4.3	10.4	13.2	37.9	35.8	2.5	5.1	160	161
October	16.6	15.9	18.2	15.7	5.5	4.3	70.3	69.2	4.7	4.3	11.0	13.6	36.3	36.4	2.8	4.8	165	164

## ALL INDUSTRY DIVISIONS

	—Washington—		—Oregon—		—California—		TOTAL PACIFIC	
	1942	1943	1942	1943	1942	1943	1942	1943
January	522	638	292	339	2,232	2,611	3,046	3,588
February	535	634	301	341	2,229	2,642	3,065	3,617
March	544	646	325	348	2,248	2,663	3,117	3,657
April	565	648	350	349	2,298	2,685	3,213	3,682
May	583	643	339	351	2,527	2,694	3,249	3,696
June	602	655	356	361	2,367	2,726	3,325	3,742
July	627	673	387	362	2,485	2,734	3,499	3,769
August	638	665	363	361	2,558	2,776	3,559	3,802
September	653	675	381	362	2,573	2,717	3,607	3,754
October	649	667	360	350	2,575	2,702	3,584	3,719

## MANUFACTURING

	—Washington—		—Oregon—		—California—		TOTAL PACIFIC	
January	182	259	110	145	661	1,002	953	1,400
February	188	255	114	145	683	1,022	985	1,422
March	192	257	121.6	147	696	1,036	1,011	1,440
April	197	256	129.6	147.2	736	1,052	1,063	1,455
May	205	255	131	148	758	1,050	1,094	1,453
June	219	263	139.8	153.7	789	1,061	1,148	1,479
July	235	274	148.4	157.3	860	1,080	1,080	1,511
August	251	271	150.4	157.9	928	1,142	1,329	1,571
September	266	279	160.5	161.3	946	1,088	1,373	1,538
October	265	278	150.6	150.8	946	1,066	1,362	1,496

## Electric Energy—November Power Load Turns Downward

Production of Electric Energy for Public Use—In Thousands of Kilowatt Hours—Source: Federal Power Commission

	Production of Electric Energy for Power Use in Industries of Mountain States														
	1943	MONTANA	IDAHO	WYOM.	COLO.	NEW MEXICO	ARIZONA	UTAH	NEVADA	TOTAL MOUNTAIN	WASH.	OREGON	CALIF.	TOTAL PACIFIC	
January		213,629	102,021	19,710	89,621	37,364	309,377	61,283	235,346	1,068,351	661,838	358,264	977,670	1,987,771	
February		195,179	96,982	18,054	79,624	34,048	190,949	44,459	212,981	872,276	616,219	327,065	996,819	1,940,163	
March		211,314	97,021	19,452	87,336	36,960	216,865	50,058	265,277	984,283	689,966	358,817	1,107,202	2,159,985	
April		181,181	118,927	20,292	82,131	38,728	222,445	49,104	247,139	959,947	682,966	348,953	1,132,227	2,164,146	
May		205,605	122,700	26,558	81,677	38,266	265,685	47,694	269,825	1,058,010	698,471	389,494	1,239,465	2,327,430	
June		201,687	115,247	29,316	78,842	38,428	280,288	45,862	278,148	1,067,798	697,763	370,026	1,272,391	2,340,180	
July		217,075	123,272	34,675	85,943	40,758	322,526	48,909	274,703	1,147,861	704,949	392,453	1,365,434	2,462,836	
August		235,592	122,753	35,135	87,053	43,856	264,410	55,787	260,111	1,124,696	701,848	419,192	1,419,201	2,540,241	
September		225,227	117,165	23,928	89,863	41,255	276,091	46,832	260,991	1,081,352	780,776	408,871	1,362,769	2,552,416	
October		244,685	110,958	20,972	93,091	40,270	300,702	50,762	284,437	1,145,877	831,305	430,335	1,317,501	2,579,141	
November		234,174	105,282	20,338	94,670	38,336	279,389	52,025	299,159	1,123,373	860,165	419,929	1,277,015	2,557,169	

# FROM THE RESEARCH DIVISION OF WESTERN INDUSTRY

## War Production Contracts—(See News Story on Page 19)

In Thousands of Dollars—Source: War Production Board Statistical Division

	MONTANA		IDAHO		WYOM.		COLORADO		N. MEX.		ARIZONA		UTAH		NEVADA	
	All		All		All				All		All		All		All	
	Other	Ships	Other	Ships	Other	Aircraft	Ships	Other	Other	Aircraft	Other	Aircraft	Other	Aircraft	Other	Ships
March	199	...	3,174		19	107	...	56,396	...	4,980	...	...	...	5,425	...	1,622
April	1,754	...	...		3,894	...	...	7,284	...	...	...	...	...	96	...	643
May	—158	100	—81		782	...	...	3,855	107	...	...	...	...	824	156	197
June	191	85	51	..	..	...	1,338	63	185	...	...	...	...	1,338	...	1,737
July	852	...	1,319		5,689	...	56	1,522	142	10,000	1,399	...	...	1,131	...	1,146
August	...	...	926		693	...	...	...	263	...	...	...	...	586	...	1,538
September	472	...	203		3,367	...	587	4,363	83	...	...	...	847	2,204	...	1,357
October	2,770	320	757		65	260	...	6,185	178	...	...	6,078	...	726	...	3,971
Total from June, 1940	12,000	505	6,776		15,867	1,366	2,045	250,889	2,077	32,773	19,746	847	160,316	156	12,363	

	WASHINGTON			OREGON			CALIFORNIA			TOTAL		
	Aircraft	Ships	All Other	Aircraft	Ships	All Other	Aircraft	Ships	All Other	Aircraft	Ships	All Other
March	188,548	310,158	1,005	...	97,697	332	2,254,758	306,996	11,893	2,448,393	714,851	32,630
April	1,427	9,367	28,877	333	9,962	9,388	76,974	33,912	13,139	78,733	53,241	61,055
May	339	2,853	5,992	...	10,942	2,214	80,202	90,472	32,756	80,541	104,523	51,090
June	5,992	8,635	4,189	...	26,193	2,303	335,934	15,184	41,493	241,926	50,435	51,550
July	616	—11,339	24,850	—688	40,816	5,285	850,816	13,076	57,964	860,744	42,099	101,308
August	5,000	136,822	9,198	..	179,578	31,624	625,192	66,030	242,897	630,192	382,430	287,725
September	4,716	12,205	22,554	...	4,147	7,652	81,700	38,378	79,449	86,416	55,317	121,704
October	2,869	9,762	10,469	28	23,908	19,246	27,738	198,209	55,374	32,895	232,289	105,819
Total from June, 1940	1,363,801	1,815,945	327,583	360	834,063	129,590	8,705,236	3,490,846	1,128,571	10,104,383	6,143,560	2,085,778

## Ships—Wind Up Liberties

Rushing to complete their Liberty ship contracts as quickly as possible and get going on the Victory type, shipyards on the Pacific Coast completed 95 ships in December, the largest number in the entire year of 1943. The tonnage was slightly below the peak month of August, however. From now on the output will be materially lower, because the Victory type ships are slower to build. Total number of ships built for Maritime Commission for the year was 958. This does not include the big landing craft program of the Navy nor other naval vessels.

### Monthly figures below:

(Includes destroyer escorts and small aircraft carriers, but not larger naval vessels built by the navy itself. Also includes concrete barges, but not tugs or wooden barges. Tonnage figures from September on are adjusted, previous months unadjusted. Deadweight tons are used as a rough measure of the cargo carrying capacity of the ship. All figures from U. S. Maritime Commission statistical department.)

	No. of ships	Thousands of deadweight tons
January	54	330
February	70	641
March	80	772
April	78	792
May	84	816
June	81	869
July	77	844
August	85	989
September	80	838
October	76	787
November	78	776
December	95	969

## Stocks—Surpluses and Shortages

Supply and materials picture as reported by coast headquarters of the Redistribution Division of WPB: practically no steel plate on hand, but a large quantity of hot and cold rolled strip, cold finish and enameling sheets, galvanized and hot rolled sheets, also angles, channels, wide flange beams. Large amount of welding electrodes and round aluminum tubing available. Good supply of transformers, and motors of most sizes, especially the large, but vertical hollow shaft from 10 h.p. up needed. Also needed are metal cutting band saws, paint spray guns, and steam-driven condensate pumps. Most of the machine tools turned back from the aircraft

industry are specialized, not so much adapted to general usage. WPB is now issuing a monthly bulletin from San Francisco on materials and equipment available and needed, called The Redistributor.

## Freight—Tonnage Trend

	Carload Shipments—Class I Railways	
	Originated	Terminated
TOTAL MOUNTAIN—1943	4,044,347	2,599,319
January	3,679,932	3,196,349
February	4,173,486	3,612,960
March	3,765,372	3,337,481
April	3,597,431	3,359,456
May	...	...
TOTAL COAST	5,780,494	6,562,550
January	5,390,673	6,116,474
February	6,203,700	7,626,997
March	6,265,215	7,730,334
April	6,923,575	7,928,765
May	...	...

## Canning—Output Down

California had a record pack of canned vegetables in 1943, but on account of a short fruit crop the total fruit and vegetable output of 44,903,909 cases fell below the levels of 1941 and 1942 when 46,257,200 and 49,233,116 cases, respectively, were packed.

For the 1944 season a tremendous volume is expected, as there is a big crop in the making. It is believed there will be enough cling peaches for a 15 million case pack of that item, which is the backbone of the California fruit canning industry. Although canned tomatoes were down, tomato juice and tomato paste packs topped previous records, the former being 1,208,436 cases above the 1942 figure, and the latter 132,592 cases. For the first time the Cannery League of California has compiled segregated figures for tomato catsup, the 1943 output being 1,792,896 cases in glass bottles and 1,086,666 cases in tin. On account of tin limitation orders, no grapes or fruits for salad were packed.

Cannery League figures are as follows:

FRUITS	
(Cases—No. 2½ can basis)	
Asparagus	1,124,922
Cherries	143,646
Pears	1,747,172
Peaches, free	536,697
Peaches, cling	10,182,027
Spiced cling peaches	21,299

Plums	62,733
Figs	942,080
Other fruits	163,389
Fruit cocktail	5,621,004
Mixed fruits	74,922

TOTAL FRUITS 24,284,018

VEGETABLES	
(Actual cases)	
Asparagus	2,070,760
String beans	521,161
Peas	440,969
Spinach	2,134,635
Tomatoes	3,532,648
Tomato juice	4,591,308
Tomato paste	2,437,202
Tomato puree	2,461,872
Tomato catsup:	
Tin	1,086,666
Glass	1,792,896
Tomato sauce and/or hot sauce	2,067,328
Other tomato products:	
Tin	244,029
Glass	308,488
Other vegetables	594,056

TOTAL VEGETABLES 24,284,018  
GRAND TOTAL 44,903,909

## THE TREND

Surplus materials from Air Corps and other armed services are being made available in such large quantities as to offer many attractive manufacturing opportunities if the manpower problem can be negotiated. Large southern California pool reported to be forming to corner some of the material, but one \$10,000,000 proposition declared by procurement officers to be "just a drop in the bucket."

Coast aluminum production not cut yet, and southern California protests that the 12-hour deliveries now being made to aircraft industry make it imperative to continue coast production. Rumors of Basic Magnesium, Inc. shutting down offset by more hopeful reports from management and evidenced by WPB's authorization of \$108,000 expenditure for plant improvements.

## New Type Carriers

Henry J. Kaiser is seeking navy department approval to build a new and improved slightly larger type airplane carrier at his Vancouver shipyard when the current contract for 50 escort carriers is completed next summer. If approval is not granted, the Vancouver yard is tentatively slated to switch over to the building of tankers when the escort carrier job is finished. Carriers will be built at the Seattle-Tacoma Shipbuilding Company's yards in Puget Sound immediately.

pleted next summer. If approval is not granted, the Vancouver yard is tentatively slated to switch over to the building of tankers when the escort carrier job is finished. Carriers will be built at the Seattle-Tacoma Shipbuilding Company's yards in Puget Sound immediately.

## Strikes Lowest In California's History

Although California houses one of the largest concentrations of war industry, and thousands of new workers have flocked in from all parts of the country, the record of industrial peace and uninterrupted production has never been better. Below are listed figures on strikes:

Average number of strikes per month:	
1935-1939 .....	16.2
1942 .....	12.2
Jan.-June, 1943 .....	7.3
June, 1943 .....	9.0
Number of workers involved per month:	
Average 1935-1939 .....	5,138
Average 1942 .....	2,192
Average Jan.-June, 1943 .....	1,570
June, 1943 .....	887
Man-days idle per month:	
Average 1935-1939 .....	107,726
Average 1942 .....	18,678
Average Jan.-June, 1943 .....	5,713
June, 1943 .....	3,409
Decrease June, 1943 below 1935-1939 average .....	96.8%

## No More Chrome

The Krome Corporation, which had been producing about 2500 tons of ore daily at Marshfield, Oregon, for the recovery of chrome and zircon, has suspended operations, the Metals Reserve Company having cancelled the chrome purchase contract.

**+450° F to -85° F**

*Controlled Rubber*

**FOR INDUSTRIAL USERS**

For sheets in the forming of hot magnesium, +450° F. and UP... press pads, drop hammer sheets... or low temperature, aromatic fuel resistant fittings, moldings, sheets and gaskets flexible to -85° F. in laboratory tests... Los Angeles Standard Rubber, Inc., can supply stocks to meet industrial users' most critical specifications.

A wide variety of stocks available... facilities for quantity production in a completely new, modern plant.



*Los Angeles*

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# KINGWELL

## PHOSPHOR BRONZE

### Bar Stock



Before machining.



Machined and finished bars



We save you this much material and machining time!

★ COMPLETELY MACHINED — BOTH O.D. and I.D.

★ O.D. CONCENTRIC WITH BORES

★ THE FAMOUS S.A.E. #660 BAR BRONZE  
(83% copper, 7% tin, 7% lead, 3% zinc.)

**25% Saving In Weight!**

**No Costly Machining!**

**No Undersurface Defects!**

THESE PHOTOGRAPHS SHOW YOU HOW MUCH TIME AND MONEY YOU SAVE BY BUYING KINGWELL MACHINED BAR STOCK.

Western Made Bronze Products for Western Industry

# KINGWELL BROS., Ltd.

SAN FRANCISCO

Sales Representatives in All Pacific Coast Cities

CALIFORNIA



## WESTERN MARKETERS AND MARKETING

A monthly column devoted to the promotional and advertising plans of western manufacturers

Effective January 3, the *McCarty Co.*, Los Angeles opens its newest office in Pittsburgh, Pa. Heading it up will be R. S. Reed, Jr., formerly advertising director for Pittsburgh Equitable Meter Co., who will service the Meter Co.'s promotion as account executive. This move follows the conviction by the McCarty Co. that Pittsburgh will be the center of a considerable post-war activity.

*Clayton Manufacturing Company*, Alhambra, California, have appointed Larry E. Huck as manager of their valve division's advertising and sales promotion department. He has begun basic planning for campaigns on the complete line of Clayton check, altitude, float, remote control and pressure regulating valves, as well as back-flow prevention units. Mr. Huck for many years was connected with Crane Company's advertising and sales promotion departments, Chicago.

From Seattle comes the announcement by Pres. Bill Horsley of *Pacific National Advertising Agency* that Trevor Evans has been added to the staff as radio director. For the past ten years Evans has been radio actor, producer, and scripter.

New account executive for *West-Marquis, Inc.*, Los Angeles is T. L. Stromberger, after more than ten years service in the advertising department of Union Oil Co., recently as advertising manager.

From the head office in San Jose, The Food Machinery Corporation announces it will release the first comprehensive campaign in its history. *The Mayers Co.*, Los Angeles, will supervise.

To the *Condon Co.*, Tacoma, after January 1, the account of Harbor Plywood Corp. Media will be trade journals and direct mail.

A further addition to the *Adolph Black Advertising Agency*, Portland, is Roy M. Bird, recently associated with Kirkpatrick of the same city. Bird formerly operated his own agency in Boise, Idaho, and Great Falls, Montana.

J. Dudley Fleischmann has become production manager of *Strang & Prosser Advertising Agency*, Seattle, replacing Arthur G. Lomax who has been promoted to vice president.

Hal Roe of the *Hal Roe Advertising Service* announces the opening of new offices at 117 West 9th Street, Los Angeles. New telephone number is VAndike 2688.

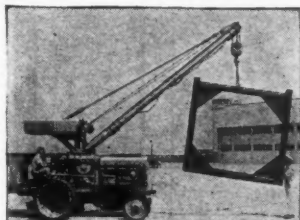
Roustabout Cranes are hustling war material at home and overseas. (U. S. Signal Corps Photo).



# MOVE IT FAST

## Anywhere, Any Time with

### Free-Roving Tractor-Footed ROUSTABOUT CRANES



Easy to operate,  
it's a whole  
crew of tireless  
roustabouts.



THE HUGHES-KEENAN COMPANY  
636 Newman Street • Mansfield, Ohio

## ROUSTABOUT CRANES

By Hughes-Keenan

THE big, bulky stuff you need to move, load, unload or stack—too heavy for men and outside the range of your installed handling equipment: Roustabout Crane handles it quickly, easily. It's where you want it, when you want it, day or night, prevents delays—tackles 6-ton loads without a whimper. Wheels or crawler tracks, all tractor power, ball-bearing boom turntable, gears in oil, full swing boom—built for years of overwork—a highly profitable investment in fast action around war-busy factories, airports, railroads, docks and warehouses. To keep things moving now, to cut post-war costs, write today for the complete Roustabout story.

# LABOR

## AND THE INDUSTRIAL WEST

### Engineers Society Seeks Bargaining Agent Powers

The Arizona section, American Society of Civil Engineers at its annual convention moved to place itself in a position to act as a bargaining agent for its members when serving as employees.

This is in line with recommendations of the national organization because under present federal labor regulations engineers are forced to affiliate themselves with other labor organizations for pay and hour bargaining purposes whether they desire to do so or not.

### Boilermakers to Do Own Tack Welding

An agreement with the AFL Boilermakers local which establishes a precedent, permits its members to do their own tack

welding. This has been obtained by Kaiser's shipyards at Vancouver and in the Portland district and has spread to Puget Sound.

Local authorities estimate \$62,000,000 will be saved on current naval and maritime contracts, at the same time making better use of available manpower. A boilermaker may work on any job within the jurisdiction of the union, provided he is qualified to do so. This concession was made by the union because they could not supply the needed welders and the Boilermakers hold the principal shipyard contracts in the Pacific Northwest.

With the concession came an increase in wage, applying to those affected by the interchangeability clause and now performing work entitling them to a higher ability classification than previously.

### Wage Guides For Los Angeles Area

Below are listed the highest approvable wartime wage rates for key jobs in the Los Angeles area, announced by the Tenth Regional War Labor Board. According to RWLB Chairman Thomas Fair Neblett, publication of the rates does not mean that wages in any office, plant or industry may be raised or lowered without first obtaining approval from the Regional War Labor Board.

#### Warehousemen and Related Occupations in Los Angeles Area

##### Light Industry

Furniture and household furnishings  
Wholesale drugs, beauty supplies and sundries  
Mail Order houses  
Wholesale and retail variety stores  
Textiles and piece goods  
Other light industry

Classification	Hourly Rate
1) • Warehouse Laborer .....	.70
2) • Warehouseman .....	.80
3) • Foreman (working) .....	.875
4) • Shipping Clerk .....	.875
5) • Receiving Clerk .....	.875
6) • Stock Clerk and Order Filer.....	.80

##### Medium Industry

Storage and Transfer  
Wine, Beer, and Liquor distributors  
Wholesale Food distributors and packers  
Cold Storage and Refrigerated Warehousing  
Agricultural Processing and Warehousing  
Automobile Supplies and Equipment  
Commercial Warehousing and Storage  
Hides and Leather  
General Merchandise and Jobbing Houses  
Other Medium Industry



## HOW TO PATCH FLOORS

... While Traffic Rolls

Roll a drum of INSTANT-USE over to the hole in the floor—remove the lid—shovel out enough to fill the hole—tamp smooth—and open the spot to regular traffic immediately, without waiting. You'll have a tough, solid, permanent patch that formerly took 24 hours to get. This rugged, new plastic bonds tight to old concrete, withstands extreme loads. Keep a drum on hand. . . . Immediate shipment.

Request Descriptive Folder

MAKE THIS TEST

### FLEXROCK COMPANY

3674 Filbert Street, Philadelphia 4, Penna.  
564B Market Street, San Francisco, Calif.  
924B S. Catalina Street, Los Angeles, Calif.

Please send me complete INSTANT-USE information . . . details of FREE TRIAL OFFER—no obligation.

Name.....  
Company.....  
Address.....



## BETTS SPRING CO.

Manufacturers of

## SPRINGS

In San Francisco Since 1868

•  
**LEAF SPRINGS**  
For autos, trucks and Tractors

•  
**COIL SPRINGS**  
for Railroad Equipment

•  
**Locomotive and Heavy Duty Springs**

•  
**Machinery, Pump and Valve Springs**

•  
**Brass, Bronze and Music Wire Springs**

Made to Order by

## BETTS SPRING CO.

868 Folsom Street

Phone SUTTER 3226

San Francisco



Classification	Hourly Rate
1) Warehouse Laborer .....	.75
2) Warehouseman .....	.85
3) Foreman (working) .....	.90
4) Shipping Clerk .....	.90
5) Receiving Clerk .....	.90
6) Stock Clerk and Order Filler .....	.80

#### Heavy Industry

Steel and Pipe  
Petroleum  
Hardware and Tools  
Machinery and Equipment  
Construction and Building Materials  
Wholesale Paper  
Wholesale Electrical Supplies and Equipment  
Truck and Transport  
Wholesale Industrial Supplies  
Other Heavy Industry

Classification	Hourly Rate
1) Warehouse Laborer .....	.75
2) Warehouseman .....	.85
3) Foreman (working) .....	.95
4) Shipping Clerk .....	.90
5) Receiving Clerk .....	.90
6) Stock clerk and Order Filler .....	.85

- Includes casual labor, extra labor, temporary labor, beginner, warehouse helper, and general labor as comparable classifications.
- Includes warehouseman, piler, loader, trucker, and stacker as comparable classifications.
- Includes head shipping clerk, head receiving clerk, floor foreman, sub-foreman, ass't foreman, crew head, head checker, and working foreman as comparable job classifications.
- Includes shipping checker, and ass't shipping clerk.
- Includes receiving checker, and assistant receiving checker.
- Includes packer, order filler, stock clerk.

#### Meat Canning in Los Angeles

Classification	Hourly Rate
Filling Line Operator	
First 60 days .....	.70
After 60 days .....	.75
Lead Girl .....	.80
Check Sealer .....	.80
Peeler, Stenciler, and Caser	
First 60 days .....	.65
After 60 days .....	.70
Cooking Kettle Operator	
First 60 days .....	.80
After 60 days .....	.90
Retort Operator and Machine Man (Depending on skill and experience)....	.90
Grinder	
First 60 days .....	.85
After 60 days .....	.90
Warehouse Helper .....	.85

#### Beer Truck Drivers in Los Angeles

Beer Truck Driver .....	1.18
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#### Confectionery Mfg. in Los Angeles County

Candy Maker, specialized .....	.85
Candy Maker, all round (may also be foreman) .....	1.00
Candy Maker's Helper (1st 3 mos.) .....	.65
Candy Maker's Helper (2nd 3 mos.) .....	.70
Candy Maker's Helper (thereafter) .....	.75
Dipper (1st six mos.) .....	.60
Dipper (2nd six mos.) .....	.65
Dipper (thereafter) .....	.70
Packer and/or Wrapper (1st 3 mos.) .....	.55
Packer and/or Wrapper (2nd 3 mos.) .....	.60
Packer and/or Wrapper (thereafter) .....	.65

#### Preserving Industry\* in Los Angeles

<b>WOMEN</b>	
First three months .....	.50
Over three months .....	.55
Over six months .....	.65
Floor Lady .....	.675
<b>MEN</b>	
First three months .....	.65
Over three months .....	.70
Over six months .....	.80
Operators of complete automatic labeling machines .....	.90
Assistant Cooks .....	.90
Head Cooks .....	1.00

#### Office Building Services in Los Angeles

Classification	Hourly Rate
Elevator Operator .....	.55
Starter .....	.60
Stationary Engineer .....	.80
Chief Engineer .....	.10 over Engineer
Janitor and Janitress .....	.55
Watchman .....	.55

#### Common Labor in Los Angeles Area

Classification	Hourly Rate
Laborer .....	.75
*Mfg. jams, jellies, marmalades.	

#### Clerical Occupations in Los Angeles Co.

Classification	Hourly Rate	Monthly Rate (40-Hour Week)
Office Boy or Girl, Mail Clerk, Messenger, Stock Boy, etc. ....	.519	90
Junior Clerk, File Clerk B. ....	.577	100
Stock Room Clerk, Acct. Clerk, Bill- ing Clerk, File Clerk A, Payroll Clerk .....	.692	120
Senior Clerk, Shipping Clerk, Head File Clerk .....	.75	130
Supervising Clerk, Office Manager .....	.923	160
Duplicating Machine Operator .....	.577	100
Addressograph Operator .....	.692	120
Key Punch Operator .....	.692	120
Calculator Operator, Comptometer Operator .....	.692	120
PBX Operator .....	.692	120
Billing Machine Operator .....	.692	120
Tabulating Machine Operator .....	.750	130
Junior Bookkeeping Machine Op. ....	.577	100
Senior Bookkeeping Machine Op. ....	.644	115
Bookkeeper .....	.750	130
Junior Accountant .....	.837	145
Senior Bookkeeper .....	.865	150
Supervising Bookkeeper .....	.881	170
Senior Accountant .....	1.212	210
Cost Accountant .....	.923	160
Junior Typist, Junior Clerk Typist .....	.577	100
Junior Stenographer, Junior Trans- cribing Machine Operator .....	.65	113
Senior Typist, Statistical Typist, Se- nior Clerk Typist .....	.721	125
Senior Stenographer, Senior Trans- cribing Machine Operator .....	.779	135
Secretary .....	.808	140
Legal Stenographer, Junior .....	.808	140
Legal Stenographer, Senior .....	.923	160
Executive Secretary .....	1.096	190

#### Mineral Output Up

New Mexico's mineral mine output, including coal, totalled \$50,057,314 for the fiscal year ending October 31, 1943, against \$43,913,377 the preceding 12 months. Total coal production was 1,804,872 tons.



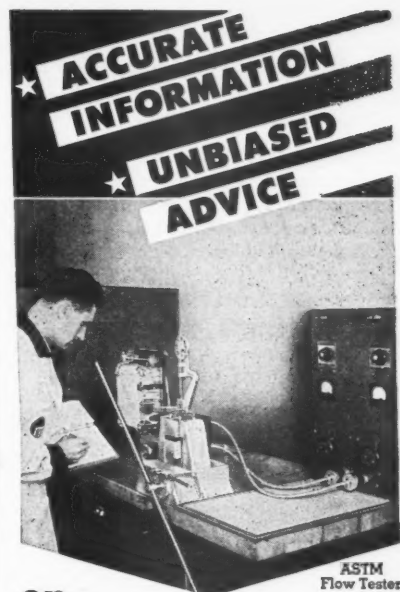
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2—5 K. V. A. Westinghouse  
4—7 1/2 K. V. A. Westinghouse  
3—10 K. V. A. Westinghouse  
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### Women's Heads Not Protected

Women suffer three times as many injuries to the head and scalp as a result of not wearing adequate head protection as they do injuries caused by clothing entanglement in machinery, it is reported by George A. Sherman, safety engineer, California Industrial Accident Commission. Machine tool operators suffer 50 per cent of the clothing entanglement injuries.

Reporting on a sampling study of accidents reported to the commission, he said:

"There were three predominant types of injuries caused as a result of either the improper wearing of clothing, head protection, or gloves, or failure to wear safe clothing or head protection.

\* "In determining the relative frequency of these three types of injuries the study

revealed that there are three times as many injuries to the head and scalp as a result of not wearing adequate head protection as there are injuries caused by clothing entanglement in machinery.

"Approximately the same ratio exists between head injuries due to hair entanglement and injuries caused by entanglement of gloves in moving machinery. In other words, on the basis of approximately every 100 injuries of the three types mentioned, 60 were caused by hair entanglement, 20 by garment entanglement, and 20 by glove entanglement.

"Fifty per cent of all injuries to head and scalp occurred while operating drill presses when the operator's hair wound in around the spindle, chuck or drill. Forty per cent of the head injuries occurred when the operator's hair wound around exposed shafting. Hair entangling in moving parts of production machinery accounted for 6 per cent while the nip points of belts and pulleys and exposed grinding wheels accounted for the remaining 4 per cent of the head injuries.

"Operators of drill presses, lathes, grinders, and other machine tools were victims of 50 per cent of the garment entanglement type of accident. Forty per cent of the injuries caused by this type of accident occurred when clothing became entangled in production machinery while

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the remaining 10 per cent occurred on exposed shafting and in the exposed nip points of belts and pulleys.

"The biggest 'headache' to the injured, as well as those engaged in accident prevention, is the large percentage of head injuries caused by hair entanglement. By far, the majority of women wear head protection, either caps, hats, nets, snoods, or bandanas; but unfortunately the percentage of women who wear proper head protection correctly is extremely small.

"The chief offense is the habit of wearing the hat on the back of the head exposing the hair at the front—the very location where nearly all the injuries occur. Improperly tied ends of bandanas are a source of trouble. One woman was seriously injured when a loose end of the bandana wound around a drill which subsequently caught her hair and partially scalped her."

### New Wage Rates

Shattuck Denn Mining Corporation, Bisbee, Arizona, has been ordered by the Nonferrous Metals Commission of the NWLB to establish the following rates, retroactive to February 3, 1943:

Job Title	Rate per 8-hr. Day
First Machinist .....	\$8.81
Machinist Special .....	8.21
Machinist .....	7.89
Electrician Handyman .....	8.21
Welder Special .....	8.21
Welder .....	7.89
Senior Carpenter .....	8.21
Carpenter .....	7.89
Rock Drill Repairman .....	8.21

Miami Copper Company, Miami, Arizona; International Smelting and Refining Company and Inspiration Consolidated Copper Company, Inspiration, Arizona, are to put into effect the following rates which have been agreed upon by the companies and unions and reported to the Nonferrous Metals Commission:

Job Title	Rate per 8-hr. Day
(a) at Miami Copper Company	
Chute Tapper on Grizzly Level.....	\$6.56*
Trackman (Head) .....	7.31
Trackman .....	7.19
Pipeman (Runs rock drills).....	7.19*
Pipeman .....	7.19
Pipe Helper .....	6.88
Motorman (ore trains) .....	7.51
Trainman—broken down into two classifications, i.e.: .....	
Trainman .....	6.56*
Chute Pullers .....	6.88
Tool Nippers .....	6.88
Mucking Machine (new class.).....	withdrawn
Shaker Operator (new class.).....	withdrawn
Fireman .....	7.19

(b) at Inspiration Consolidated Copper Co.  
Toolhouseman and Nipper..... \$6.56\*

(c) at Internat'l Smelting & Refining Co.  
Skimmer ..... \$7.19 || Skimmer-Converters ..... | 7.19 |
| Crane Chasers ..... | 6.25 |

(\*) Indicates no change

### Labor Turnover

#### Decline 35 Per Cent

Labor turnover in the San Francisco Bay area between November 15 and December 11 decreased from 11.5 per cent to 7.5 per cent, according to report of Sam Kagel, Northern California WMC director. The report is based on a survey of establish-

ments employing 67 per cent of those in essential ratings.

Labor turnover in the Oakland-East Bay territory dropped somewhat more than in the total San Francisco metropolitan area. The East Bay rate averaged 39 per cent against the 35 per cent area decrease, while in one plant a drop of 56 per cent in turnover occurred.

### What's On The Worker's Mind

Questions submitted to 536 employees in six firms by the Merchants and Manufacturers Association in Los Angeles revealed that 98½ per cent of the workers

hoped to remain in California after the war. Three out of every four women workers did not want to go back to housework. To the question "Will government own post-war industry?" 90 per cent responded "No."

Eighty-two per cent of the workers were worried about other than money matters; 69 per cent were satisfied with their present state of affairs. To the question "If you were boss what changes would you make in your present job?" 28 per cent suggested changes in supervision, 23 per cent in wages, 15 per cent in working conditions, 13 per cent changes in methods, 10 per cent changes in safety.

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# THE WEST ON ITS WAY

## ARIZONA

**BUILDINGS**—Del E. Webb, 302 S. 23rd Avenue, Phoenix, has been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of gunnery trainer buildings, school building and utilities at AAF advanced flying school at Yuma, Ariz., to cost \$111,405.50.

**PLANT**—Defense Plant Corp. and Reconstruction Finance Corp. have authorized expenditure of \$150,000 for establishment of a customs asbestos purchasing station and processing plant at Globe, Ariz.

**WAREHOUSES, ETC.**—W. S. Ford, Kingman, Ariz., has been awarded contract by U. S. District Engineer Office, Phoenix, for construction of ammunition storage warehouses, paving and utilities at AAF Flexible Gunnery School, Kingman, Ariz.

**CLASSROOMS, ETC.**—M. M. Sundt Construction Co., 440 S. Park Ave., Tucson, Ariz., has been awarded contract by FWA for construction of new classrooms, office, etc., at Sunnyside School, Tucson, Ariz., to cost \$43,675.

**CONSTRUCTION**—P. W. Womack Construction Co., 1712 S. Central Ave., Phoenix, has been awarded \$422,700 contract by U. S. Navy, San Diego, for construction of an auxiliary acceptance unit at Litchfield Park, Ariz.

## CALIFORNIA

**BUILDINGS**—Steel M. Calhoun, Los Angeles, has been awarded contract by Western Pipe and Steel Company, Shipbuilding Division, for construction of building in San Pedro, Calif.

**DWELLING UNITS**—Wm. C. Crowell Company, Pasadena, has been awarded \$714,000 contract by FPHA, for construction of temporary dwelling units at Cabrillo Homes, Long Beach, Calif.

**GASOLINE STATION**—P. A. Weeger, Los Angeles, has been awarded contract by U. S. District Engineers for construction of gasoline station at an army air force supply depot, Maywood, Calif.

**FACILITIES**—Defense Plant Corp. has authorized \$400,000 increase in contract for additional facilities at plant in Los Angeles County to Vega Aircraft Corp., Burbank, Calif.

**STOREHOUSE**—Stolte, Inc., 8451 San Leandro St., Oakland, has been awarded contract by Navy Department, Washington, D.C., for construction of storehouse at Alameda Naval Air Station, Calif.

**BUILDING**—Carlsen and Franz, 50 Oak Grove, San Francisco, have been awarded contract by U. S. Engineer Office, San Francisco, for construction of paint and spray building at Hamilton Field, Calif.

**DETENTION WARDS**—M. A. Imhoff and Associates, San Gabriel, have been awarded contract by U. S. District Engineer Office, Los Angeles, for reconstruction of detention wards, Pasadena Area Station Hospital, Pasadena, Calif.

**CONSTRUCTION**—Albert Reingardt, Long Beach, has been awarded contract by U. S. District Engineer Office, Los Angeles, for additional construction at Muroc, Kern County, Calif., to cost between \$70,000 and \$80,000.

**BUILDINGS**—O. L. Carpenter, 353 Spreckels Theater Building, San Diego, has been awarded \$203,430 contract by U. S. Navy, San Diego, for construction of quarters for WAVES at the Naval Air Station, San Diego, Calif.

**CONSTRUCTION**—E. L. French, Sacramento, and M. L. Poundstone, Porterville, have been awarded contracts by U. S. District Engineer Office, Sacramento, for construction in Shasta, Sacramento, Butte, Kern and Tulare Counties, Calif.

**SCHOOL**—Harvey A. Nichols, Los Angeles, has been awarded \$220,990 contract by U. S. Navy, for construction of a fire fighting school, San Pedro, Calif.

**BUILDINGS**—James I. Barnes Construction Company, Santa Monica, has been awarded \$459,214 contract by U. S. Navy, San Diego, for construction of buildings for housing Marine Corps Women's Reserve at Camp Elliott, San Diego, Calif.

## Downs Safety Plate Grips



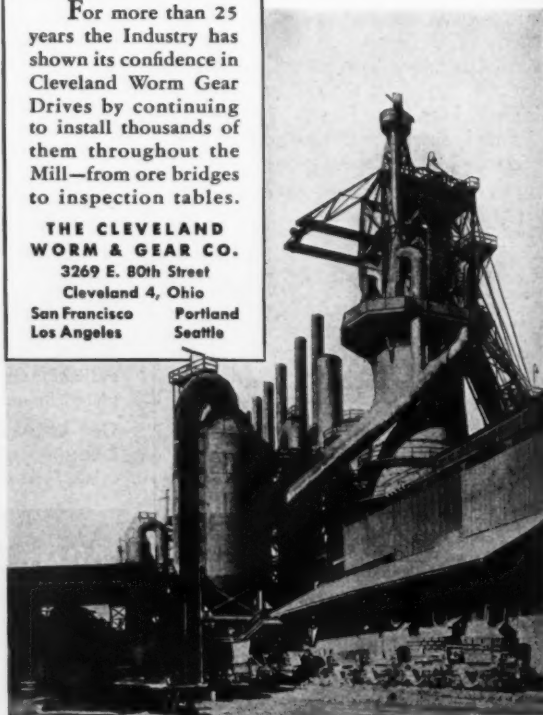
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**OFFICERS' SERVICE CLUB**—W. C. Beggs, 610 S. Broadway, Los Angeles, has been awarded \$62,322.36 contract by U. S. District Engineer Office, Los Angeles, for construction of officers' service club at Muroc, Calif.

**DWELLING UNITS**—E. S. McKittrick Co., Inc., 7839 Santa Fe Ave., Huntington Park, has been awarded \$198,899 contract by Housing Authority of San Bernardino County, for construction of 100 temporary family dwelling units in San Bernardino.

**MESS HALL, ETC.**—MacDonald & Kahn, Inc., 200 Financial Center Building, San Francisco, have been awarded \$66,485 contract by Navy Department, Washington, D.C., for mess hall, detention area and facilities at Naval Recreation Barracks, Shoemaker, Calif.

**NURSERY SCHOOL**—Elmer J. Freethy, 1432 Kearney Street, El Cerrito, Calif., has been awarded \$69,195 contract by District Engineer Office, Berkeley, for construction of Pullman Nursery School, Richmond, Calif.

**FACILITIES**—Coast Counties Construction Company, 242 E. Alisal Street, Salinas, Calif., has been awarded contract by U. S. Engineer Office, San Francisco, for construction of facilities at Camp Roberts, Calif.

## COLORADO

**CONSTRUCTION**—R. E. Wear, Montrose, Colo., has been awarded contract by U. S. Engineer Office, Denver, for construction at an airfield in El Paso County, Colo.

**BUILDING**—E. B. Jones, Jr., 1010 S. Josephine Street, Denver, has been awarded contract by U. S. District Engineer, Denver, for construction of engine operations building in vicinity of Denver, to cost more than \$45,000.

**BUILDING AND UTILITIES**—M. E. Carlson, 4483 Newton Street, Denver, has been awarded contract by U. S. District Engineer, Denver, for construction of building and utilities at an airfield in Otero County, Colo.

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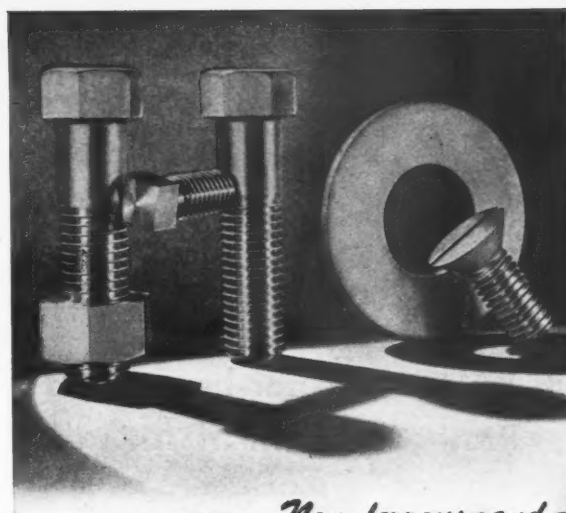
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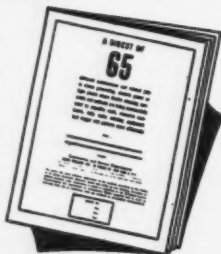


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**CLEANING**

## THE WEST ON ITS WAY

**FACILITIES**—Defense Plant Corporation has authorized \$110,000 increase in contract for additional facilities at a plant in Pueblo County, Colo., owned by Colorado Fuel & Iron Corp., Denver.

**WAREHOUSE**—Mead & Mount Construction Company, Denver National Building, Denver, has been awarded contract by U. S. District Engineer, Denver, for construction of warehouse in vicinity of Denver, Colo.

## IDAHO

**HEATING PLANT**—Harry R. Bowers, Inc., Denver, Colo., has been awarded \$135,000 contract by U. S. Navy, Washington, D.C., for construction of central heating plant at Camp Farragut, Idaho.

**HEAVY CONSTRUCTION**—J. A. Terteling & Sons have been awarded \$40,000 contract by U. S. Army Engineers, Portland, for heavy construction in Elmore County, Idaho.

**BUILDINGS**—J. O. Jordan & Son, Boise, have been awarded contract by U. S. Army Engineers, Portland, for construction of buildings in Ada County, Idaho.

## MONTANA

**TRAILERS**—Dudley-Anderson Company, Great Falls, Mont., has been awarded contract by Great Falls Housing Authority for construction of 100 family trailers.

**BUILDINGS**—Dudley Anderson Company, Great Falls, has been awarded \$100,000 contract by U. S. District Engineer Office, Seattle, for construction of buildings at Great Falls, Mont.

**BUILDING WORK**—Dudley Anderson Company, Great Falls, Mont., has been awarded \$111,395 contract by U. S. Army Engineers, Seattle, for building work at Great Falls, Mont.

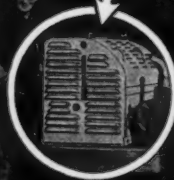
## NEVADA

**CONSTRUCTION**—N. H. Sjoberg & Son, 5604 E. 16th St., Oakland, Calif., have been awarded \$50,000 contract by Western Pacific Railroad Co. for construction in Elko, Nev.

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1424 11th Avenue, Seattle, Washington

WESTERN INDUSTRY—February, 1944

**BUILDINGS**—Wm. P. Neil Construction Co., Ltd., Hawthorne, Nev., has been awarded \$206,077 contract by Bureau of Yards and Docks, Washington, D.C., for construction of TNT reclaiming building, booster building and bank building at Hawthorne, Nev.

## NEW MEXICO

**DWELLING UNITS**—Modern Movable Homes, Memphis, Tenn., has been awarded \$124,300 contract by FPHA, Fort Worth, Texas, for construction of 60 family dwelling units, Gallup, N. M.

## OREGON

**HOUSING UNITS**—Carl O. Johnson, 1800 N.E. 63rd, Portland, has been awarded \$93,440 contract by Clackamas Housing Authority for construction of 40 housing units, Molalla, Ore.

**LAUNDRY PLANT**—Bureau of Yards and Docks, Washington, D.C., has approved construction of a laundry plant for the naval station port docks at Astoria, Ore., to cost about \$88,500.

**COLD STORAGE PLANT**—Defense Plant Corp. has authorized construction of a \$150,000 addition to the ice manufacturing facilities of the cold storage plant under construction for the Northwestern Ice & Cold Storage Company, Portland, Ore.

**APARTMENTS**—Dan J. Malarkey, 923 S.W. 17th St., Portland, has been awarded \$330,209 contract by Home Owners Loan Corp., Portland, for conversion of Multnomah Block at W. Burnside and 19th Avenue into apartment building.

**SHOP, ETC.**—A. Richie & Co., Walla Walla, have been awarded contract by U. S. District Engineer Office, Portland, for construction of carpenter shop, etc., at Umatilla Ordnance Dept. near Hermiston, Ore., to cost \$224,768.

**CONSTRUCTION**—Parker-Schram, Couch Building, Portland, have been awarded contract by U. S. Army Engineers, Portland, for heavy construction work in the Portland, Ore., area.

**ALTERING BUILDINGS**—Brennan & Cahoon, Pendleton, Ore., have been awarded contract by U. S. Army Engineers, Portland, for altering buildings at Hermiston, Ore.

## PLASTIKSTEEL

the lining that protects your tanks and stacks from corrosion

**PLASTIKSTEEL** Waterproof Lining for Steel or concrete tanks insures perfect protection from alkaline deposits such as brine, chlorine, soaps, etc. **PLASTIKSTEEL** is absolutely tasteless—no fumes to contend with in making application with whisk broom or trowel. **PLASTIKSTEEL PASTE** added to **PLASTIKSTEEL** Waterproof Lining creates a superior bond on smooth surfaces including **WOOD**.

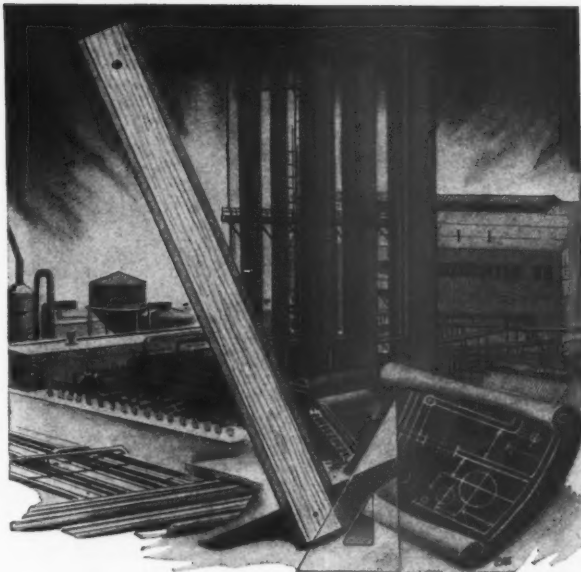
**PLASTIKSTEEL** High Heat Lining, when applied with whisk broom or trowel to steel smoke stacks or breechings, gives perfect protection from sulphurous deposits formed by the condensation of gases. **PLASTIKSTEEL** High Heat Lining has the same coefficient of expansion and contraction as steel plate and is guaranteed for five years.

*PLASTIKSTEEL* Products have been in service over a period of years in many cases by firms such as Southern Pacific Co., California Packing Co., Hawaiian Electric Co., Best Foods Co., Simmons Co., Langendorf Bakeries, Luer Packing Co. and many others from coast to coast.

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The experience of Western Asbestos Co. extends back over 35 years. During this time, they have built and enhanced an enviable record.

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In these times of war when speed and experience are so vital, call on Western Asbestos Co. If you are starting to plan post-war building projects, they will be pleased to discuss them with you.

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**T**HOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

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Flexco HD Rip Plate



Flexco HD Belt Fastener

**FLEXCO HD BELT FASTENERS**  
SOLD BY SUPPLY HOUSES EVERYWHERE

## THE WEST ON ITS WAY

### UTAH

**BUILDING**—Perkins Construction Company, 626 Dooley Building, Salt Lake City, has been awarded contract by FPHA for construction of building at Tooele, Utah.

**WAR TRAILERS**—Lym-Horman, 2683-13th East, Salt Lake City, have been awarded contract by FPHA for construction of 63 temporary war trailers at Garfield, Utah.

### WASHINGTON

**RESIDENCES**—Lagerquist Bros., 12702-15th Ave. N.E., Seattle, have been given contract for construction of 35 residences in the neighborhood of the 7500 block on 18th and 26th Avenues N.W., Seattle, Wash.

**PUMP HOUSE**—Woodworth & Company and Macdonald Building Company, Moses Lake, have been awarded contract for pump house in Grant County, Wash., by U. S. Army Engineers.

**ADDITIONAL CONSTRUCTION**—Airport Builders, 212 W. Hudson Street, Seattle, have been awarded \$91,429 contract by U. S. Army Engineers for additional construction in Skagit County, Wash.

**MISCELLANEOUS COUNTY**—Howard S. Wright & Company, 407 Yale Ave. North, Seattle, has been awarded contract by U. S. Army Engineers for miscellaneous construction in Snohomish County, Wash.

**ADDITIONAL INSTALLATION AND CONSTRUCTION**—McAttee & Heath, E. 3527 Trent Ave., Spokane, have been awarded contract by U. S. Army Engineers for additional installation and construction in Grant County, Wash.

**ADDITIONAL CONSTRUCTION**—L. S. Ross Construction Company, 4554 Thackery Place, Seattle, have been awarded contract by U. S. Army Engineers for additional construction at Paine Field, Snohomish County, Wash.

**CONSTRUCTION**—Hylan and Underwood, 1727 Burwell, Bremerton, have been awarded \$166,783 contract for construction at Port Orchard, Wash.

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**ADDITIONAL FACILITIES**—Sound Construction Company and Ford J. Twaits Company, Spokane, have been awarded \$48,210 contract by U. S. Army Engineers, Seattle, for construction of additional facilities in Spokane County, Wash.

**CONVERSION**—Home Owners' Loan Corp. is to carry cost of \$40,000 for conversion of theater building at 2308-24th Ave. North, Seattle, into a 24-apartment structure.

**CONSTRUCTION**—Sound Construction & Engineering Company, Morrison-Knudsen Company and Ford J. Twait & Sons have been awarded contract by U. S. Army Engineers, Seattle, for additional construction at Auburn, Washington, depot.

**ADDITIONAL CONSTRUCTION**—Western Construction Company, Arctic Building, Seattle, has been awarded contract by U. S. Army Engineers, Seattle, for additional construction at Seattle, Wash.

**BUILDINGS**—Gaasland Construction Company, Ephrata, has been awarded contract by U. S. Army Engineers, Seattle, for construction of buildings at Ellensburg, Wash.

**ADDITIONAL CONSTRUCTION**—Manson Construction and Engineering Company, 821 Alaskan Way, Seattle, has been awarded contract by U. S. Army Engineers, Seattle, for additional construction at Seattle, Wash.

**STEAM PLANT AND INCINERATOR**—General Installation Company, Olympia, has been awarded \$63,000 contract by U. S. District Engineer Office, Seattle, for installation of a steam plant and incinerator at Fort Lewis, Wash.

**ADDITIONAL CONSTRUCTION**—Aqua Systems, Inc., New York City, has been awarded contract by U. S. Army Engineers, Seattle, for additional construction at Mount Vernon, Wash.

**HOUSING**—Bergeson, Wick and Dahlgren, Tacoma, have been awarded contract by FPHA for a 200-unit addition to the Duwamish Bend housing unit, to cost \$414,561.

**HOUSING**—Strand & Sons, 3935 University Way, Seattle, have been awarded \$284,000 contract by FPHA for 140-unit extension of the Taylor Avenue temporary housing project, Seattle, Wash.

**AIRCRAFT CARRIERS**—Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash., has been awarded contract by U. S. Maritime Commission for

construction of 15 medium sized aircraft carriers, to cost between \$150,000,000 and \$180,000,000.

**BOILER HOUSE**—J. C. Boespflug Construction Company, Securities Building, Seattle, has been awarded \$117,000 contract by U. S. District Engineer Office, Seattle, for construction of a boiler house and heating plant facilities at Fort Lewis, Wash.

**SCHOOL**—Bergesen, Wick & Dahlgren, Seattle, have been awarded \$108,475 contract by FFWA for construction of school building at Seattle, Wash.

**SCHOOL**—Cecil R. Beal, 730 Republic Building, Seattle, has been awarded \$101,430 contract by FWA for construction of the High Point School, Seattle, Wash.

**ADDITIONAL CONSTRUCTION**—Bay Construction, Inc., 309 Pontius Avenue, Seattle, has been awarded \$91,646 contract by U. S. Army Engineers, Seattle, for additional construction work in Seattle, Wash.

**CONSTRUCTION**—Airport Builders, 212 W. Hudson Street, Seattle, have been awarded contract by U. S. Army Engineers, Seattle, for additional construction at Mount Vernon, Wash.

**GENERAL CONSTRUCTION**—Nelse Mortensen & Company, 1021 Westlake Ave., North, Seattle, have been awarded contract by U. S. Army Engineers, Seattle, for general construction at Seattle, Wash.

**ADDITIONAL CONSTRUCTION**—Clyde M. Ludberg, Spokane, has been awarded \$341,400 contract by U. S. Army Engineers, Seattle, for additional construction work at Ephrata, Wash.

**CONSTRUCTION**—Sound-Kiewit, Seattle, has been awarded \$68,900 contract by U. S. Navy Department for construction at Quillayute on Olympic Peninsula, Wash.

**NURSING HOME**—Daniels & Turnquist, Orpheum Building, Seattle, have been awarded contract for improvements to the Annetta Austin Nursing Home, 9005 Roosevelt Way, Seattle.

## WYOMING

**TRAILER UNITS**—Rognstad-Olsen, Casper, Wyo., have been awarded contract by FPHA, Kansas City, Mo., for construction of 100 trailer units, Casper, Wyo.



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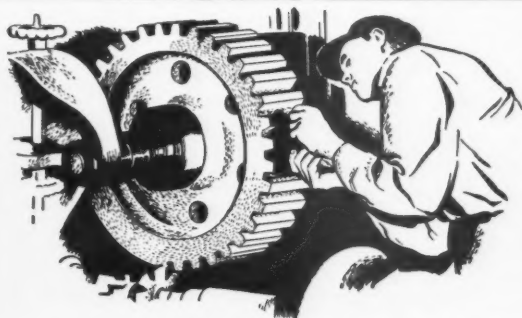
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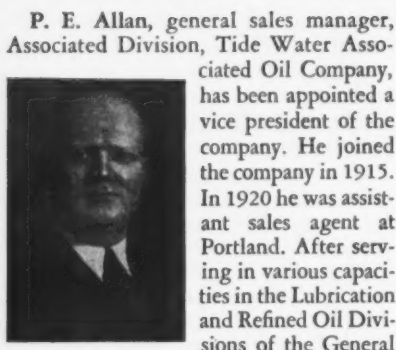
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## WESTERN

# TRADE WINDS

NEWS ABOUT THOSE WHO DISTRIBUTE AND  
SELL INDUSTRIAL EQUIPMENT AND MATERIALS



**P. E. Allan**, general sales manager, Associated Division, Tide Water Associated Oil Company, has been appointed a vice president of the company. He joined the company in 1915. In 1920 he was assistant sales agent at Portland. After serving in various capacities in the Lubrication and Refined Oil Divisions of the General Office, Allan became District Sales Manager in San Francisco and Domestic Sales Manager of the Associated Division.

**J. F. Bechtle** has joined the Standard Steel Corporation, Los Angeles, as assistant general manager.

**Thomas J. Bannan**, who heads up several industrial plants in principal Coast manufacturing areas and is an executive of Pacific Gear and Tool Works and subsidiaries, has purchased the Hallidie Machinery Company of Seattle.

**David A. Nelson** has joined the Detroit Broach Company as vice president and will be general manager of the West Coast plant in Beverly Hills, California.

**Harvey A. Craig**, for many years vice president of Rheem Mfg. Co., Richmond, Calif., has been appointed Los Angeles district sales manager, Republic Steel Corp., Cleveland, and **Arthur C. Geldner**, assistant district sales manager.

Attention has been directed to certain inaccuracies in the news item appearing in this column of our January number concerning the revised operations of the **Walworth California Company**.

We are advised that the arrangements made with the distributors mentioned in our January news item apply only to territories formerly covered by Walworth California Company direct branch houses.

The Walworth California Company will continue to operate as a wholesale distributor of industrial products serving the industrial trade in the Bay area. They will be supported in this program by the following distributors: Petroleum Equipment Company, San Francisco, and the Gilson Supply Company, Oakland. Thus complete coverage will be provided for the trade in northern California in cooperation with distributors recently established in their former branch house territories.

**Milton J. Maguire** has been appointed resident manager of the Portland, Oregon, office of the Hercules Powder Company. **J. V. B. Cox** has been named assistant manager.

**C. W. Garvey**, formerly with WPB, has been appointed general manager of the Oakland plant of Gilmore Steel & Supply Company, Inc., jobbers of steel products, pipe, valves, fittings, engineers and marine supplies. Mr. Garvey was section head in the warehouse branch of the Steel Division of WPB.

**Peter Storti** has been appointed manager of the Combustion Equipment Division of the Enterprise Engine and Foundry Company of San Francisco.

**John B. Ross**, formerly with Linde Air Products Company, has been appointed to the West Coast engineering office of Handy & Harman.

**Jack Manildi** has been appointed manager of sales of Pacific Tube Company, whose plant in East Los Angeles is the first steel tube mill west of the Rocky Mountains. Before joining the firm of Pacific Tube Company, Mr. Manildi had been connected with Oil Well Supply Company as a sales representative, and before that he was with General Petroleum Corporation.

The **Murray Brokerage Company**, 18 Wazee Market, Denver 4, Colorado, has been appointed sales representative for American Engineering Company, Philadelphia, for their Lo-Hed electric hoists.

**Los Angeles Standard Rubber, Inc.**, has completed a new manufacturing plant at 1500 East Gage Avenue, Los Angeles. The building which covers an area of 35,000 square feet, houses some of the most modern rubber manufacturing equipment in the West, including an up-to-date laboratory for testing synthetic and natural rubber products to the industrial user's most critical specifications. Supervision of the company's several branches throughout Los Angeles will be directed from the new plant.



**Stuart H. Betsinger** has been advanced to the position of sales manager of Kinney Aluminum Company, Los Angeles, after being with them for over a year as sales engineer. Be-

fore his association with Kinney Aluminum he was employed with Western Pressure Control Company and Union Oil Company of California in engineering capacities.

**Kilsby & Graham**, whose home office is in the Standard Oil Building, Los Angeles 15, have opened a branch office in the Russ Building, San Francisco, with **Hoyt Jones** as manager. In addition to warehouse stocks of steel tubing carried in Oakland, Kilsby & Graham represent **Sivyer Steel Casting Company**, Milwaukee; **The Babcock & Wilcox Tuber Co.**, Beaver Falls, Pa.; **Duraloy Company**, Scottsdale, Pa.; and the **Wm. F. Klemp Co.**, Chicago.

**Kenneth C. White**, San Francisco branch manager Owens-Illinois Glass Co., Pacific Coast Division, has been appointed general sales manager of the Libbey Division of Owens-Illinois Glass Co., Toledo, and **Leland S. Connick**, who has been branch manager in Los Angeles, has been appointed branch manager at San Francisco. **Thomas E. Manwarring**, formerly assistant branch manager in San Francisco, takes Connick's former position of branch manager at Los Angeles.

**James A. Kennedy** has been named California field engineer for Spang-Chalfant, Inc., Pittsburgh, with headquarters in Los Angeles.

**E. Van Vechten**, previously associated with American Airlines and past president of the Chicago Purchasing Agents Association, has joined the Weatherhead Company, Cleveland, as Western representative with headquarters in Los Angeles.



L. S. Connick T. E. Manwarring

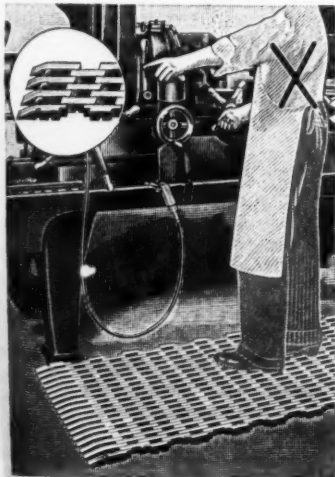


# THE SHOWCASE

**Starter Test Stand**—New AMSCO Starter Test Stand has simplified the operation by providing single mounting plate for right or left direction S.A.E. 5, 6 or 7 inch aircraft starters. Consistently reliable starter tests are obtained by the torque action of the starter transmitted through a two-way torque arm to a double-action hydraulic cylinder which in turn registers in foot-pounds on a maximum limit hand pressure gauge. It is arranged in a cabinet 38 inches high, 36 inches wide and 28 inches deep. All wiring and moving parts are fully enclosed. *Airplane Manufacturing and Supply Corp., North Hollywood, Calif.*

**Metal Arbor Spacer**—A new sized spacer. This .0015" metal spacer permits setting of milling machine cutters down to as fine as .0005 spacing. *The Detroit Stamping Co., Detroit, Michigan.*

**Under-Foot Safety Mats**—Sur-Mat is a new product developed to reduce leg-strain and minimize under-foot hazards. It is made of long-wearing hardwood sections, woven together with galvanized, rust-resisting spring wire. It snugly follows the contour of the floor and assures a firm but restful footing for workers. The bevelled ends reduce tripping hazards and the open-work design permits the filings, metal chips, sawdust, etc., to fall therein and provide a safe, clean footing for the worker. A special nesting feature for adjoining sections permits use around all types of machinery. It is quickly and easily rolled for floor cleaning purposes and regardless of size and number of sections used, it lays



as one solid continuous mat and does not shrink. *The Surty Mfg. Co., Inc., Dept. W1, Chicago, Illinois.*

**Paint Stick Marker**—Markal Paintstik marker for icy, wet, sleek or oily surfaces designated as Markal "B" has been developed especially for shipyards, steel mills, and other outdoor locations. It does away with paint and brush in layout and hull departments, fabricating shops, yards, and other places where weather-proof, fade-proof and permanent markings are a definite "must" in order to avoid delays and confusion. It has all the properties of liquid paint, yet is handy and clean as a pencil and gives extra mileage. It is made in a variety of colors so that each color may be used for easy identification purposes as well as for piece work marking. *The Markal Company, Chicago, Illinois.*

**Flow Indicating Meters for Oxygen**—EMCO flow indicating meter is a simple, compact instrument to measure the rate of



flow of oxygen, and will provide instantaneous readings and require neither calculations nor application of correction factors. It is constructed entirely from metal. *The Pittsburgh Equitable Meter Company, Pittsburgh, Penna.*

**Electrically Heated Airbrush**—Type F974 electrically heated airbrush heats both air and material and has latest type calibrated control of fan spray, a new type cup with



large 3-5/8 in. opening and removable snap-on cover which makes cleaning and filling easy. It is fully insulated and thermostatically controlled for applying heated materials up to 320° Fahrenheit. *Paasche Airbrush Co., Chicago, Illinois.*

**High-Heat and Waterproof Lining**—Plastiksteel High-Heat Lining retards corrosion in high-heat equipment. It has the same coefficient of expansion and contraction as steel, thereby making a perfect bond. Plastiksteel Waterproof Lining is an efficient, economical, easily applied corrosion-protective product for tanks storing hot or cold water, soap, chlorine, brine or any other substance subject to corrosion. *Plastic Steel Service, San Carlos, California.*

**Leak Fixer**—Pabco Black Hydrosel repairs leaks effectively. It is not a temporary patch material, but one that has lasting qualities. It is simple to apply and can be used without experience by following very simple directions. Some of the many places it may be used are: skylights, ventilator pipes, reservoirs, tanks, light wells, concrete walls, etc., and materials on which it may be used are: asphalt roofing, composition shingle roofs, any kind of metal, concrete, wood, brick. *The Paraffine Companies, Inc., San Francisco 19, California.*

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**WESTERN INDUSTRY**  
503 Market Street  
San Francisco

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## THE SHOWCASE (Cont'd from Page 67)

**Nut and Bolt Retainer**—"Click," a new type of nut and bolt retainer, is adaptable to any aircraft, marine or ordnance nut or bolt and interchangeable with other anchor fittings. Installation, whether riveted or spotwelded, is simple and positive. *Kaynar Manufacturing Company, Los Angeles, Calif.*

**Clamp**—New aluminum alloy clamp Type "D" combines maximum strength with extremely light weight and applies a uniform radial pressure to the periphery of the parts over which it is installed. These light weight clamps are particularly suited

for use in ventilation, carburetor intake, supercharger, intercooler and similar installations where medium and large sizes are required and maximum weight savings can be realized. *Marman Products Company, Inc., Inglewood, Calif.*

**Welding Aid**—Smith's Spatter-Off makes it unnecessary to grind off the spatter after welding. Apply Smith's Spatter-Off with a brush to the surface where spattering normally occurs. After welding, take a wet or dry cloth and wipe the spatter away. The result is a closer knit and smoother surface and weld rust is practically eliminated. *Smith Chemical Co., Los Angeles, Calif.*

**Industrial Gloves**—"Fingerless" steel reinforced glove No. 14962 is a sturdy chrome tanned cowhide glove with finger and thumb tips removed, is reinforced ver-



tically with steel ribbons; steel stitched, the glove is practically rip proof. A leather patch adds extra wear and protection on palm and junction of palm and thumb. An excellent glove for use where finger "touch" is necessary, along with the utmost in protection on palm and lower portion of thumb and finger. *Industrial Glove Company, Danville, Illinois.*

**Identifiers**—S-184 Identifiers, a group of colored identification coatings for tracer wire applications, expedite the winding of electrical equipment. It can be applied by running the wire through the varnish or by dipping the entire coil of wire in it and gives a smooth finish, drying very fast and permitting handling in less than one minute after application. Can be supplied in any color. *The Sterling Varnish Company, Haysville, Penna.*

**Air-Operated Collet**—The Red-E-Air Chuck is used to accurately chuck screw machine parts for second operation work on drill presses, tapping machines, milling machines, etc., for drilling, tapping, reaming, threading, chamfering, burring, counterboring and similar operations. The tool is operated by a foot valve, leaving the operator's hands free to load and unload. Speed of handling work is increased. *Cleveland Airtool Company, Cleveland 3, Ohio.*

**Condensers with Air Filters**—Wat-R-Miser evaporative condensers with built-in air filters to protect against impurities in the cooling system effect heat transfer by means of water evaporation in a continuously moving airstream. They are adaptable to a wide variety of industrial applications such as cooling batch quenching fluids, cooling oil for large diesels, cooling jacket water, etc. The new air filter feature is standard equipment in all models and is all metal, yet rust proof. *Drayer & Hanson, Inc., Los Angeles 21, Calif.*

## Announcing!

*Our new steel warehouse;—Now ready to serve the mighty Industrial Army of the East Bay . . .*

We take pleasure in announcing the formal opening of our new offices and warehouse at 1960 Cypress Street in Oakland.



Located in and planned to meet the ever expanding needs of the East Bay and surrounding territory, this new plant is geared to the important task of providing industry with "IMMEDIATE STEEL" so essential to maintaining wartime production schedules.

There is something more than just a stock of steel housed in this new plant—a complete "STEEL SERVICE" is now

available. Competent personnel to give you cooperation on your steel problems—complete adequate stocks in all types and sizes. Ample facilities to handle efficiently all orders—large or small. In brief—here is a modern, progressive "wide awake" organization pledged to give you the finest, most satisfactory steel service in the West.

Call Gilmore on your next requirement for steel.



## GILMORE STEEL & SUPPLY CO., INC. *Steel Service*

1960 CYPRESS STREET  
GLENCOURT 1680  
OAKLAND

825 FOLSOM STREET  
EXBROOK 4500  
SAN FRANCISCO

# YOURS FOR THE ASKING

1370

**Safety Booklet**—Twelve-page booklet GEQ-217, "Safety Regulations for Women in Industry" invites the co-operation of all women, especially new workers, in following the safety practices which General Electric has found effective by past experience. It is especially directed to women working on machines and on men's jobs. Seventeen general safety pointers are given, together with illustrations and descriptions of how to obtain and wear the Company's approved safety clothing and other safety articles. The publication is not intended as a complete guide, but as a supplement to the Company's Red Book of "Safety Instructions and Information." *General Electric, Schenectady, New York.*

1371

**Tools, Dies, Jigs and Fixtures**—Equipment list which enumerates and illustrates facilities of company which provides comprehensive engineering service. *Cataloy Corp., Detroit, Mich.*

1375

**Lead and Wire Seals**—Catalog lists wide variety of tamper-proof lead and wire seals of interest to railroads and shippers. Illustrations and detailed specifications as to diameter, thickness, type of seal, sealing presses and other information are contained in this catalog. *The Chicago Car Seal Company, Chicago, Ill.*

1376

**Decimal Equivalent Chart Calendars**—Two sizes of Decimal Equivalent Chart Calendars, one 7" x 15" and the other 13" by 27". *Dayton Rogers Mfg. Company, Minneapolis 7, Minnesota.*

1377

**Pumps**—Catalog descriptive of REX Speed Prime Pumps contains complete information on mechanical parts and construction of pump, how the pump operates and what it will do, also specifications and capacity charts to aid in pump selection. The pumps are made in capacities ranging from 3000 to 125,000 gallons per hour. Their chief use is for dewatering purposes and among the many advantages for this service is their positive self-priming feature. They have found application in many industries and for pumping many fluids. *Chain Belt Company, Milwaukee, Wisconsin.*

1378

**Cemented Carbide Tipped Tools**—"Catalog and Engineering Manual of Carbide Tipped Tools" gives information on lathe tools, reamers, end mills, core drills, centers and compilation of useful engineering data. *Carbide Fabricators Company, Royal Oak, Michigan.*

## 2 HEAVY DUTY, SPARK-PROOF FLOORING MATERIALS That Keep 'em Rolling...!



The above photo illustrates how heavily laden, small-wheeled trucks sail over a ROCK-TRED resurfaced loading platform.

### ROCK-TRED RESURFACER

Ready-mixed Rock-Tred is a heavy-duty, spark-proof resurfacer that can be easily and quickly applied over worn concrete, brick, metal, wood or composition floors, trucking aisles, loading platforms, etc.

Because it is factory prepared, Rock-Tred requires no mixing. Simply spread it over the old surface and trowel to a smooth finish. And, within 12-24 hours it will take any load that can be moved on wheels.

### SPEED PATCH Fixes Floors, Loading Platforms, Ramps, and other areas without Delay, Takes Loads Immediately

Here's the toughest floor repair on the market. Quick too. In fact, broken floors, etc., can be repaired at the rapid rate of 1 sq. ft. per minute. And what's more... heaviest loads pass right over the repaired area the moment it is completed. Simple directions are—fill the broken area with ready-mixed Speed Patch and tamp solid. Nothing is easier—nothing is faster—nothing is better.

ACT AT ONCE... Keep your floors in tip-top condition, traffic fast and load worthy, by resurfacing with Rock-Tred, and making quick emergency repairs with Speed Patch.

Write for Complete Details and Prices Today!

### ROCK-TRED CORPORATION

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350 S. ANDERSON STREET - LOS ANGELES 33, CALIFORNIA  
2003 RANGEVIEW DRIVE - GLENDALE 1, CALIFORNIA



1372

**Heat Treating Furnace**—Booklet "The Heat Treating Furnace" has been produced for those who have only recently experienced the essentiality of heat treating and for those who have the tremendous job of converting war production lines to products for peace. *Surface Combustion, Toledo, Ohio.*

1373

**Accounting and Control Manual**—Instructive 45-page booklet, "Accounting and Control Manual," summarizes methods used by The Cooper-Bessemer Corporation to control operations in their plants and was originally compiled to acquaint their own employees with various departmental functions, the regulation of which enables management to assure continued profitable production of the company's products. It is now offered to others as an educational aid in furthering their knowledge of principal methods and procedures essential to plant operation. *The Cooper-Bessemer Corporation, Mount Vernon, Ohio.*

1374

**Electronic Equipment**—Folder dealing with Rotobridge Automatic High Speed Mass Production Circuit tester describes how the Rotobridge detects trouble and errors automatically, tests a circuit a second, and checks circuit resistance values as low as .001 ohms, with Wheatstone bridge precision. *Communication Measurements Laboratory, New York.*



1379

**Regulators**—"Gas-O-Dome Regulators" describes the Victor Gas-O-Dome Regulators which have gas-loaded instead of spring-loaded diaphragms. They are made for inlet and delivery pressures which are much higher than can be handled adequately with spring-loaded diaphragm regulators. *Victor Equipment Company, San Francisco 7, California.*

1380

**Drum Controllers**—Bulletin No. 4303, gives information on multi-speed drum controllers for machines operated by motors ranging up to 10 horsepower. This catalog lists over 200 different Furnas controllers, giving descriptions, prices, wiring diagrams and dimensional drawings. *Furnas Electric Company, Batavia, Illinois.*

1381

**Hydraulic Machinery**—Catalog of the semi-loose-leaf type (pages can be added or taken out) deals with many phases of hydraulics as applied to machine tools and aviation. There are sections devoted to hydraulic power units, hydraulic test benches, special machinery and presses. *Hydraulic Machinery, Inc., Dearborn, Michigan.*

1382

**Marine, Industrial, Refinery Products**—Bulletin No. 5 "Balco Products" is descriptive of various products including ball and socket joints, steam whistles, ship bells, fog horns, gongs, engine room instruments, flanges, and also tells of their service department. *Ballou Service & Instrument Company, Inc., 75 West Street, New York, N. Y.*

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